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Agricultural Outlook Forum

Proceedings

Presented by the U.S. Department of Agriculture

February 22 and 23, 1995

Arlington, Virginia

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PREFACE

The U.S. Department of Agriculture held its first Agricultural Outlook Forum on February 22 and 23, 1995. Nearly 800 people attended the event, which was held at the Stouffer Renaissance Hotel at National Airport in Arlington, Virginia.

The Forum was the seventy-first outlook meeting sponsored by USDA. While maintaining the traditional focus on the near-term outlook for agriculture and farm commodities, the Forum inaugurated several important changes. A new emphasis was placed on the long-term horizon for the farm sector, which is well reflected in the speeches in this volume. To encourage substantive discussion of agriculture's future, USDA provided Forum participants with a report entitled "Long-term Agricultural Baseline Projections, 1995-2005," Staff Report WAOB-95-1. A copy of the report is included as an attachment to these proceedings.

The Forum was designed to encourage a lively discussion about the future, which is evident from the diversity of speakers and the opinions expressed. Speakers at the plenary sessions on the opening afternoon addressed future farm policy directions. Participants at a series of "forum" sessions on the second day of the meeting discussed the major economic and sectoral issues for the future.

Audio tapes of all sessions, and video tapes of the plenary sessions provide a complete record of both presentations and questions and answers. Readers interested in obtaining tapes are referred to the order form at the back of this volume.

Additional copies of these proceedings are available from ERS-NASS, 341 Victory Drive, Herndon, VA 22070; phone 1-800-999-6779.

GERALD A. BANGE
Chairperson
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April 1995

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KEYNOTE ADDRESS, AGRICULTURAL OUTLOOK FORUM
Washington, D.C. -- February 22, 1995

INTRODUCTION

Good afternoon.

I am pleased to welcome you all to the first Agricultural Outlook Forum. The federal government has been doing a lot of reinventing for the last two years. So while we were at it, we reinvented the Department of Agriculture's traditional Outlook Conference.

The program has been redesigned to focus on the long-term prospects for agriculture and to become a forum on the major economic forces of the late 1990s.

The end of this century will be an important time for American agriculture. We are entering a new era for the federal government and for its role in agriculture programs -- an era of less and more efficient government.

It will be an era of new trade rules and opportunities.

We are very pleased to report today that we are revising the forecast of U.S. agricultural exports upward to a record \$48.5 billion in fiscal 1995. That is an increase of \$3.5 billion from our November 1994 forecast and nearly \$5 billion above the previous record high set in 1981. The agricultural trade balance is now forecast to be a \$20 billion surplus, up from our previous estimate of \$17 billion. The details will be released at 3 p.m. today.

This is a tremendous accomplishment for American agriculture. This good news is another example of the Administration's commitment to increasing farm income through expanding international markets. It is an economic opportunity that must be built upon through full use of our market development and promotion tools as well as domestic farm and research policy that maintains competitiveness.

The new era we are entering also will be one of progress in conservation, food safety, nutrition awareness and rural development. And the 1995 Farm Bill will be the rule book for this new era.

At USDA, we've already begun to prepare with the most massive reorganization in the Department's history. USDA is well situated to execute the policy initiatives which will emerge from the 1995 Farm Bill.

We know that we must approach everything we do with an eye on the federal deficit. And we know that we must reexamine the way government works.

USDA's reorganization is a first step. And we are now going further with the second phase of the National Performance Review when we must take a close, critical look at the federal role in all our programs.

We are fortunate to have Dan Glickman coming on as Secretary to lead us in this self-examination.

Along with continuing the reorganization of USDA, Dan will tackle the 1995 Farm Bill. He has been through four Farm Bill debates and served on the House agriculture committee for 18 years so he knows exactly what the questions are and what the stakes are.

CCC OUTLAYS

For the third straight year, President Clinton has proposed a budget to create a smaller, more effective, more disciplined government for average Americans.

Budget constraints will drive the Farm Bill. And although agricultural programs have been pared significantly beginning with the 1985 Farm Bill, Congress and the American people will look for more savings from the agriculture sector.

Like every other part of the federal government, we will take cuts in an effort to reduce the federal deficit. Therefore, the President's budget proposes a reduction of \$1.5 billion in Commodity Credit Corporation outlays to be taken over the 1998-2000 period.

Specific measures to achieve these targeted savings will be proposed soon.

CCC outlays during the 1980s reached historically high levels because of farm policy and changing world economic conditions which led to the worst farm financial crisis since the 1930s.

During most of the years from the 1930s until the early 1980s, CCC net outlays ranged from less than \$1 billion, or even net receipts for some years, up to about \$6 billion in nominal terms.

The 1970s saw low CCC outlays as exports grew rapidly and market prices were high. This situation changed abruptly in the early 1980s as export markets collapsed. CCC outlays peaked at nearly \$26 billion in fiscal year 1986.

The experience of the past decade and a half should remind both farmers and policymakers that agriculture is a very risky enterprise -- difficult to predict and control.

Numerous policy reforms, as well as an improving world economy, have led to the decline in CCC outlays since the mid-1980s.

Average annual CCC outlays are currently projected to decline from \$16 billion for the period 1986-1990 to \$11 billion for the period 1991-1995, and to less than \$8 billion for the period 1996-2000 with no change in current law.

The decline in outlays since the mid-1980s reflects the market-oriented program reforms included in the Food Security Act of 1985, as well as reductions in payment acres, mandated marketing assessments, land retirement under the CRP, and other provisions of the FACT ACT of 1990 and the Omnibus Budget Reconciliation Act of 1990. Additional cost reduction reforms were also enacted in budget reconciliation and other legislation in recent years.

Budget estimates for the out-years also reflect significant demand for farm products from expanding world income, growth in U.S. demand for food and industrial products, such as ethanol, and new trade opportunities from the North American Free Trade Agreement and the GATT Uruguay Round Agreement on Agriculture.

The estimates also reflect reduced spending for ad hoc disaster assistance as crop insurance reform is implemented.

Finally, there will be additional Conservation Reserve Program signups and extensions of existing contracts that will not only benefit the environment, but strengthen crop prices and reduce spending for price and income support programs.

Changes in programs since 1981 show the dramatic reductions in the government's budget exposure for farm programs.

For example, a typical corn producer today receives deficiency payments roughly one-third the level they would be without the reforms, based on changes in the program provisions since the 1981 Farm Bill that include a decline in target prices and payment areas as well as frozen program yields.

So the declining trend in outlays, the analyses of potential outlays had policies not been changed, and a review of the changes in program provisions all show clearly that substantial changes have been made over the past several years to reduce both budget exposure and producer dependence on the programs.

The farm support programs are prime examples of real spending reductions in the entitlement area in recent years.

Before the President released his 1996 budget, I sat down with him to talk about future agriculture policy. The results of his thinking on the subject are apparent in his budget plan. The President's budget makes a clear commitment to continuing support for American agriculture.

CHANGING FARM POLICY

So budget concerns are bringing change—perhaps substantial change—to farm policy. But cuts will be made carefully. We understand that we are not just dealing with numbers but with programs that affect people's lives. We will make our budget cuts by making good farm policy.

In developing USDA's part of the 1996 budget:

- We kept in mind that USDA must sustain a solid economy that provides opportunity for growth and prosperity for farmers, ranchers and others living in rural America.
- We kept in mind that we must ensure that Americans continue to enjoy the world's best and most affordable food supply.
- We kept in mind that USDA must ensure that food assistance is available to those in need in response to a clear public consensus that ensuring low-income people an adequate, affordable diet is a public, federal responsibility.
- We kept in mind that USDA must continue to shrink and streamline its management structure to provide more efficient service with less bureaucracy.
- We kept in mind that USDA must not forfeit the gains achieved in conservation and environmental quality.

These are the same issues we must keep in mind as we go about creating the new Farm Bill.

Tough questions are being asked about the federal government's place in farm programs. And we should ask tough questions during a Farm Bill debate.

We need to answer those questions while maintaining the integrity and security of essential farm programs.

AMERICAN AGRICULTURE

While fewer Americans live on farms, USDA's programs touch the life of every American citizen. The American food and fiber system generates nearly \$1 trillion in economic activity each year--16 percent of our gross domestic product. It is a system which accounts for 1 out of 6 American jobs. And agriculture is one of the few sectors of our economy that maintains a positive trade balance.

But we must acknowledge certain realities as we enter this new Farm Bill Debate:
NEW CONGRESS

First, our society is more urban and suburban than ever and this is reflected in the new Congress that will write the Farm Bill.

The Congress that will make agriculture policy for the rest of this century is made up of men and women who generally don't have a rural or farm orientation.

In fact, more than 75 percent of the House Agriculture Committee has never been through a Farm Bill debate.

They are more likely to question the status quo and to want change. And, they may be less aware of the symbiotic relationship between agriculture's economy and the nation's economy.

So we need to emphasize—over and over—to Congress and to the public—the connection between economically healthy farms and a safe, abundant food supply, and the Nation's overall economic health.

TRADE

Second, we are now competing in the most open global market of this century. The growth of this market and new international trade agreements will influence our domestic programs and export programs.

Getting the GATT accord signed was just a beginning. The next steps are effective GATT implementation around the world, expansion of NAFTA toward an Americas Free Trade Agreement, and a free trade agreement among the 18 nations of the Asia-Pacific Economic Community.

Export programs must position U.S. agriculture to benefit fully from the opportunities available from these trade agreements. The Clinton Administration worked hard to secure the GATT agreement, opening foreign markets where 96 percent of the world's consumers live. The Farm Bill must help U.S. producers to use these new opportunities through market development, market promotion, and activities to offset unfair competition.

SAFE FOOD AND NUTRITION

Third, public concerns are focused on food safety and nutrition. These are clearly areas where the federal government should be involved and they are areas central to the next Farm Bill.

Because we have ensured an abundant, wholesome, and low-cost food supply, U.S. consumers on average spend just over 11 percent of their disposable income on food. But low-income households spend one-third and more of their income on food.

Food assistance programs are an economic and nutrition safety net. Federal food assistance programs must be preserved to ensure that the needy are fed and that national nutrition goals and standards are not forfeited.

Nutrition education should become an integral part of all USDA food assistance programs.

USDA's food assistance programs play a part in our agricultural economy as well as an important part in the lives of one in five Americans -- many of them children. These food programs are directly connected to the farm and the market. Each dollar of targeted food assistance increases retail food spending.

USDA outlays on food stamps alone generates \$10 to \$12 billion in yearly retail food purchases. The School Lunch Program accounts for 6 percent of all fluid milk sold in the United States. Food assistance programs are certainly linked to a strong agricultural economy.

The Administration has serious concerns about the impact of this block grant approach on the health and well-being of the nation's children. Throughout their history, USDA's Child Nutrition and WIC programs have produced significant and measurable nutrition outcomes among the children who participate in them.

The programs work because national nutrition standards are established, required, and verified, and because the funding structure ensures that the program can expand to meet the increased needs that would be created by a recession or similar economic downturn.

The proposed block grant structure would eliminate both of these protections, leaving children vulnerable to shifts in the economy, and to changes in nutrition standards that could be driven more by cost considerations than children's health. For these reasons, the Administration opposes block grants for USDA's Child Nutrition and WIC programs.

While we must ensure an abundant and affordable food supply, we must also ensure that the food our citizens eat is safe. Last month, USDA proposed sweeping changes in federal meat and poultry inspection. We propose to go from a system based on sight, touch and smell to one based on scientific testing and systematic prevention of contamination. The new system will save society thousands of lives and billions of dollars.

These reforms demonstrate this Administration's strong commitment to making meat and poultry safer for consumers. Food safety will remain a key function of USDA.

The proposed regulatory moratorium contained in H.R. 450, in contrast, will not move us forward. It will not result in a government that works better and costs less. It will, in fact, smother important regulations such as the Hazard Analysis and Critical Control Point (HAACP) systems approach.

ENVIRONMENT

Fourth, we must continue our sound stewardship of America's land and natural resources. USDA is responsible for encouraging good land, water, and forest practices on much of the nation's land.

More than half our employees work in the area of natural resources and environment. It's a mission we take seriously.

Research, education, technical, and financial assistance, and land retirement programs need to be used collectively to develop low-cost, effective solutions to environmental problems.

We must continue to rely on voluntary programs but we must also encourage local identification of problems and solutions.

Budget pressures make it more important than ever to focus conservation efforts on the most critical soil, water, wetland, and wildlife issues.

Agriculture must continue its tremendous record of response to public concerns for conservation and environmental protection.

At the end of last year, USDA took several actions regarding the Conservation Reserve Program that will benefit taxpayers, producers and the environment.

The CRP, which provides annual rental payments to farmers who retire environmentally sensitive cropland, has enrolled 36.4 million acres reducing soil erosion, improving water quality, expanding wildlife habitat, enhancing wetlands, and encouraging tree planting.

The Administration has announced that it intends to modify and extend CRP contracts and improve the targeting of the CRP to the most environmentally sensitive acres.

By giving CRP participants an opportunity for early release from their contracts, we will be able to enroll new, more environmentally sensitive acres. This will increase the cost-effectiveness of the program.

The use of easements will enable very long-term retirement of the most fragile lands without the need for concern that the land will ultimately return to production.

RURAL AMERICA

Fifth, rural development policy should be an integral part of the 1995 Farm Bill.

Given limited resources, we need to focus rural development on persistently poor counties; areas facing adjustment problems; and individuals and communities lacking clean, running water and adequate housing.

Rural America must have equitable access to economic infrastructure to compete. This means equitable access to adequate credit and access to modern communication systems symbolized by the information superhighway.

The three rural Empowerment Zones and 30 Enterprise Communities announced by the Clinton Administration in December were an important first step.

The gap between rural and urban America has narrowed significantly since commodity and rural programs began in the 1930s. However, rural areas continue to face economic disadvantages, including low population density, remoteness, and a high proportion of low-wage jobs.

Approximately half a million rural households lack basics, such as clean water, indoor plumbing, and adequate shelter. The Farm Bill is an important opportunity to address broader needs of America's rural areas.

RESEARCH

Finally, our Farm Bill deliberations must recognize the need for USDA to continue to emphasize research, education, and economic analysis.

We must provide a sound scientific basis for all that we do and be able to continue the remarkable gains in agricultural productivity that have made food and fiber so affordable and which can help solve our environmental problems, and improve farm profitability.

Effective research is fundamental to solving problems from food safety to sustainability, increasing efficiency and competitiveness, and opening new economic opportunities.

CONCLUSION

Traditionally, making agricultural policy has been a bipartisan endeavor, and I see no reason for that to change.

Secretary-designate Glickman and I look forward to working with the ag committees under Senator Lugar and Representative Roberts. They are both experienced leaders who know agriculture, and I believe we can develop a bipartisan farm policy that is in the best interest of American agriculture.

The President means it when he says that the tax cut he has proposed will let the middle class share fully in the economic recovery he has already begun. But he will not support any effort to cut taxes unless it's paid for, and he will not let tax cuts explode the deficit, as they did in the 1980s.

In discussing the Middle Class Bill of Rights in his State of the Union address, the President described the test he will give every policy, every piece of legislation, that comes before him. The test is quite simple:

Does it advance the interests of average families? Does it promote their values? Does it build their future?

If it does, the President will support it; if it does not, he will oppose it.

As an experienced agriculture policymaker, Dan Glickman has said that farm programs have been a pretty good deal for the American people: a stable, secure supply of food at reasonable prices.

As a veteran legislator, he has said that agriculture is not and should not be immune to change.

The 1995 Farm Bill will have to pass the President's test: Does it advance the interests of average Americans? Does it promote their values? Does it build their future?

We have our work cut out for us as we enter this Farm Bill debate.

But I know members of both parties have a common goal: We all want to build a strong America—and I believe that can only happen if American agriculture is strong.

I welcome your questions.

OUTLOOK FOR U.S. AGRICULTURE

Keith Collins
Acting Chief Economist
U.S. Department of Agriculture

My goal over the next 20 minutes is first to comment on agriculture's prospects for 1995/96. With a full day of commodity details coming tomorrow, I will skim and focus more on the aggregate indicators. Then, I will say a few words about the longer term outlook by taking a quick look at USDA's baseline.

Macroeconomic Environment

The outlook for 1995/96 is heavily influenced by what is happening this year in commodity markets, by U.S. and world economic growth in 1995 and 1996 and by the Department's policy decisions regarding the 1995 crop programs.

We just heard an excellent discussion of the economic growth prospects by Laura Tyson. For agriculture, we focus on a few key macro variables: GDP, inflation, interest rates and exchange rates, which present a generally promising picture for agriculture in 1995.

On the positive side, U.S. 1995 GDP growth will slow from last year's 4 percent rise, but it is likely to remain solid at 2.5-3.5 percent. The exchange rate picture also looks positive for exports, with last year's dollar depreciation carrying into 1995. On the negative side, farmers will face some pressure on their production costs, with a slightly higher inflation rate. With key interest rates forecast to be 2 to 3 percentage points higher than in 1993. Farmers' total interest expenses in 1995 will be about \$2 billion more than in 1993.

The foreign economic growth picture is especially good for agricultural exports, with Mexico a notable exception. Global economic growth is projected at 3.3 percent, compared with 2.8 percent in 1994.

Agricultural Exports

The vigorous growth in many foreign economies, particularly in Asia, reduced foreign production of certain crops and our own record crops have worked together to boost U.S. agricultural exports to a projected record high this fiscal year. Mr. Rominger stated the Department has forecast a record level of \$48.5 billion. Despite major changes in trade prospects with some countries, such as the FSU, U.S. agricultural exports have trended up the past 4 years. Even so, there has been disappointment that exports in the early 1990's did

not continue the rapid growth of the late 1980's. It now looks like this year's exports will show the kind of hoped-for surge that rewards the efforts to improve competitiveness, and are so important to the farm economy.

A distinguishing feature of this year's export gains is that bulk export volume is expected to be up sharply. Our crop year export volume forecasts show the source of much of the growth: wheat, up 6 percent; rice, up 12 percent; soybeans, up 33 percent; feed grains and cotton, up about 40 percent.

China has been an important factor. U.S. exports to China fell to only \$300 million 2 years ago but will exceed \$1.5 billion this year--a more than 5-fold increase over two years.

General Farm Financial Picture

The farm financial outlook for 1995 is for a continuation of the 1994 pattern. Net cash income is projected to be \$51 billion, marginally higher than 1994 but otherwise the lowest since 1986. Cash receipts from crops will be the highest in the 1990's but largely offset by smaller receipts from livestock, the lowest level in the 1990's. Government payments are forecast to increase from \$8 billion to about \$10 billion with the largest increase expected for feed grains. Increased interest expenses will be the biggest expense factor squeezing farm profitability in 1995.

The farm sector balance sheet and income picture indicate producers will take on more debt in 1995, for the third consecutive year. However, the overall farm sector debt-to-asset ratio will remain relatively comfortable at 16.3 percent. The 1995 combination of higher debt and increasing interest rates with nearly flat net cash income is something to watch with concern, but it hardly constitutes a crisis. Lending institutions are in good shape and farm debt repayment capacity is substantial.

USDA also tracks average farm operator household income, which reflects the fact that many farm operator households operate small farms and depend on off-farm jobs. Total farm operator household income is expected to average \$40,500 with just \$4,900 or 12 percent coming from the farming operation.

Commodity Outlook

I would now like to cover a few highlights for commodity markets.

The record corn, soybean, cotton, sugar, and rice crops of 1994 showed the resiliency of U.S. agriculture after the weather-reduced crops of 1993. We don't know how weather will play out in 1995 but we do know that with the exception of a few areas, this winter's weather has been favorable to this point for the 1995 crops. And, long-term drought conditions in the west have largely been broken by winter precipitation.

The 1995 wheat acreage reduction percentage (ARP) remains at 0, but following the record corn and rice crops, their ARPs have been raised to 7.5 and 5 percent, respectively--a mild application of the government brake. Cotton, too, had a record crop but record total use has led to a reduction in the 1995 ARP to 0. These policy adjustments mean that acreage required to be set-aside under the annual crop programs will total less than 5 million acres, the second lowest level since these programs began in 1981.

If you scan the outlook landscape, you'll see many exciting areas to watch in 1995/96. I'd like to mention a few. **First is the world wheat market. Just how low can stocks go?** U.S. wheat supplies are expected to be about the same as this year, which were fairly low. But, global stocks at the end of the current 1994/95 crop year are expected to be lowest since 1981/82. Current new crop futures prices are not showing alarm; they indicate traders expect an increase in global wheat production and increased competition for U.S. exports. But, it would only take crop problems in a few countries to change this attitude.

The outlook we now see is for increased U.S. production, with planted area rising 1/2 to 1 million acres. Plantings are expected to be up sharply in Australia after this past year's drought. And, production is expected to be up in Canada and the EU. On the import side, Russia is expected to import only small quantities, but China with rapid economic growth and rising food prices, will likely again be a strong market. If these forecasts materialize, U.S. exports may decline a little under the increased competition, stocks could rise and prices be down a somewhat from the \$3.45 per bushel expected for the 1994 crop.

A second key is the U.S. corn market. Will this year's 9- billion-bushel demand repeat? Strong total use is using up more of the record 1994 crop than first expected. A year ago, China's net exports were 12 million tons of corn. This year, China's net exports are likely to be less than 1 million tons, which has created an 11-million-ton export opportunity for other exporters. We do not know what China will do in 1995/96, but assuming net exports of 5 to 6 million tons will still mean good corn export prospects for the U.S. With a return to average yields in the U.S. and 2-3 million fewer acres because of the ARP, U.S. corn production would fall to 8.8 billion bushels, compared with 1994's over 10 billion. This means the U.S. corn market will tighten, and we could see stocks fall to 1 to 1.5 billion bushels and prices rise 5 to 10 percent from this year's expected level of around \$2.20 per bushel.

A third key area is oilseeds. Can vegetable oil prices keep propping up soybean prices? The record U.S. soybean crop in 1994 is leading to the highest U.S. carryover stocks since 1985/86, over a half billion bushels expected in storage this September. Yet prices have been relatively strong, dropping to the near the mid \$5.00 per bushel range, compared to the similar situation in the mid-1980's when prices dipped below \$5.00 per bushel. The price help is coming from stronger soybean exports and from soybean oil where the global supply/use balance is the tightest in several years.

The higher corn ARP and prospects for higher corn prices could lower soybean plantings to less than 60 million in 1995, with production dropping about 400 million bushels. But, prices may show only a very slight rebound from this year's forecast of \$5.20 to \$5.50 per bushel because soybean ending stocks are likely still to be near 400 million bushels. Price gains will be limited by good South American soybean crops available this summer and fall, and larger 1995/96 crops in India and China. Malaysia's palm oil crop also is likely to rise strongly in the last half of calendar 1995.

A fourth key is cotton. Can total use top 20 million bales again in 1995/96? This year, USDA is forecasting record total use of 20.7 million bales to go along with the record production of 19.7 million bales. As a result, carryover stocks this August 1 are projected to be a paltry 2.7 million bales. This is only 13 percent of total use, compared with the Farm Bill target of 29.5 percent. The upshot has been cotton futures prices flirting with the fantasy level of \$1.00 a pound. In 1995, the 0 ARP and the higher prices will raise acreage to around 15-16 million acres and production could exceed the 1994 record. Exports are likely to retreat but domestic use could rise again. The outcome is some stock increase--to 3 to 4 million bales-- which would still signal a tight cotton market with strong prices.

A fifth key is livestock. Here the question is, how much meat can we all eat? Strong growth in beef, pork, and broilers boosted total meat production 5.5 percent in 1994 and a 3-4 percent increase is forecast for 1995. Per capita consumption is being pushed to record levels, with 1994 per capita red meat and poultry consumption up 5 pounds per person to over 212 pounds (retail basis). And, consumption is expected to jump again to over 218 pounds per person in 1995. The beef cow herd has been growing rapidly over the last couple of years and producer returns fell in 1994 and are likely to remain down in 1995. Pork production too has been rising and prices falling, although they have bounced back from last fall's low levels. However, pork production is expected to continue up setting records the next two years and prices will remain under pressure. Broiler production, too, continues expanding, rising 7.5 percent in 1994 and another 7 percent gain expected in 1995. Export growth of over 45 percent in 1994 has helped maintain broiler prices.

The American consumer will again get reasonably priced food over the next couple of years based on this outlook. For 1994, the food CPI rose 2.4 percent, once again less than the overall CPI. For 1995, the food CPI is likely to be similar to 1994, rising from 2 to 4 percent. A little slower economic growth and lower meat prices will largely offset expected modest increases in prices of vegetables, cereal and bakery products and other prepared foods.

Longer term outlook

I would like to conclude by saying a few words about the Department's long-run projections--our "baseline"--which was provided to all conference participants. These projections are not the Department's best guess of what will happen over the next 10 years. Rather, they are projections that follow from a very specific set of assumptions. For example, they assume

trend yields every year, which we know will not happen. They also assume continuation of current farm programs, which we all know will change this year. So, for example, the baseline makes no changes in programs to achieve the Administration's proposed \$1.5 billion reduction in farm program spending during 1998-2000. The baseline provides a basis for discussion of alternative farm policies or other possible events.

I want to make a half dozen points about these projections for the next decade. The first point is that we project a potentially strong macroeconomic climate. The projections for developed countries assume a long-term recovery from the below-trend growth of the late 1980's and early 1990's. For example, from 1998 to 2005, the U.S. economy is expected to settle down to about 2.7 percent real GDP growth, with consumer price inflation averaging around 4 percent per year. Other developed countries are expected to show similar patterns.

With better developed country growth and the Uruguay Round, prospects for developing countries look favorable. Asian countries are expected to maintain high rates of economic growth. India, Indonesia, Malaysia, Pakistan, Thailand, and Vietnam are all expected to grow at annual rates of 5 to 8 percent. For most African, Middle Eastern and South American countries, economic growth is projected to be stronger in the late 1990's than during the 1980's and early 1990's.

The second point is that the Uruguay Round and the economic growth just outlined are projected to cause fairly strong U.S. export growth, especially as we move toward 2000 and beyond. The value of total U.S. agricultural exports is projected to rise to \$55 billion in 2000, and to \$68 billion in 2005. High-value and bulk products both gain with high-value accounting for over two-thirds of the increase.

No country is expected to have a greater impact on the outlook for world trade over the next ten years than China. China accounts for nearly one-third of the increase in world coarse grain and wheat trade. Around the turn of the century, our baseline projects that China becomes a net importer of coarse grains, soybeans, and soybean meal, and cotton imports continue to grow.

The third point is that use of ARPs is projected to be minimal as increases in demand outpace increases in productivity. This causes crop prices and acreage planted to increase. Total acreage planted to the 8 major field crops rises 12 million acres over the projection period, with most of the increase accounted for by corn, wheat, and soybeans.

The fourth point is that with economic growth boosting domestic demand and favorable export growth, nominal farm prices generally rise, particularly as we approach the turn of the century. By the year 2000, the index of farm-level prices is 10 percent above the expected 1995 level. However, since inflation is greater, real farm prices decline. But the rate of decline is slightly less than the long term rate. For example, annual wheat and corn

prices adjusted for inflation fell about 2.5 percent on average during 1950-92. The baseline projects a decline of 2 to 2.5 percent during 1995-2000.

The fifth point is that the growth in demand and the slow strengthening of prices reduces the influence of farm programs over time. Total direct payments to producers, estimated at \$10 billion in calendar 1995, decline to \$6 billion by 2000. By 2005, payments drop to \$3 billion, and most of these are CRP rental payments. As a percent of market receipts, government payments fall from 6 percent in 1995 to only 1.5 percent by 2005. In inflation adjusted terms, payments by the end of the period are less than 20 percent of today's level.

The sixth point is that the implication of this long-term outlook for farm finance is a slow, but steady rise in nominal net cash farm income. Cash receipts rise by quite a bit but production expenses rise, too, mainly driven by increased hired labor costs, higher energy-based input costs and higher interest expenses. When farm income is adjusted for inflation, it declines over the 10-year period. Producers take on more debt and the farm debt-to-asset ratio rises slightly, placing U.S. agriculture at slightly greater risk.

Again, I want to emphasize these are projections based on specific assumptions. Of course USDA is not the only entity that produces long-term projections. The Congressional Budget Office (CBO) and The Food and Agricultural Policy Research Institute (FAPRI) also recently released the baselines they will be using for comparing and costing-out 1995 Farm Bill options. I encourage you to look at both the CBO and FAPRI analyses.

Conclusion

That completes my remarks. I have highlighted only a very few of the many fascinating topics that will be explored today and tomorrow. The farm economy in 1995 is being helped by strong U.S. economic growth and the fastest growing global economy thus far in the 1990's. Market receipts from crops will be the highest in the 1990's. However, net cash farm income will remain near the 1994 level as market receipts from livestock will be the lowest in the 1990's and production expenses are rising.

The longer term outlook will depend on the growth of the global economy and a range of policy decisions around the world. In the U.S, the 1995 Farm Bill and its outcome for the CRP, export programs, environmental programs, food programs and research will all help shape agriculture's future. We hope you learn many things about these issues over the next two days.

AGRICULTURE IN AN UNCERTAIN PUBLIC POLICY ENVIRONMENT

Norman A. Berg

Washington, D.C. Representative, Soil and Water Conservation Society

Mr. Secretary, members of the panel, ladies and gentlemen. For over three decades I've attended, as a listener, the annual USDA Outlook Conference. This time it is an honor to be asked to make a presentation. Uncertain, in contrast to the meaning of certain according to Webster, can mean doubtful, untrustworthy, not clearly identified. Agriculture, as we know from life itself, has been plagued with uncertainty. Also, agriculture since its beginning centuries ago has impacted the Earth's natural environment. Ecosystems were changed when humans first planted seeds for later harvest. Early farmers not only modified natural landscapes, they altered plants and animals through selection for improvement. The conventional tasks of producing food and fiber required removing the trees, cultivating the soil, managing water, killing insects, and adding nutrients to the soil. In the United States agriculture occupies about 900 million acres of the land base and is the largest user of fresh water from both the surface and underground sources. The intensive use of those renewable natural resources to fulfill society's expanding basic needs, food and fiber for clothing and construction materials, requires manipulating millions of acres. One certainty is that humans need food and fiber to survive. However, especially in the last few decades, the conventional methods used by agriculture to produce food and fiber have been subject to questions. This has added to the uncertainties of the weather, and other factors, that have been part of agriculture forever. To help lessen uncertainty agriculture is being challenged by the public to design agricultural policies and production systems capable of nurturing a world's growing population, with minimum destruction to the natural environment. Leaders are recognizing the need for a strategy that will reduce the risk to farm incomes, to the environment, and to future agricultural capability, and to maximize benefits to society.

What are the impacts on the environment from agriculture?

The agricultural sector of our economy has been responding favorably to environmental problems. There is recognition that even though any harm to the environment was unintended, there are public policies that are not in harmony with nature. Within the past few decades the management practices used in a productive agricultural system have led to evidence that attracts attention not only from environmentalists, but from those responsible for agricultural policy. Accelerated topsoil loss, although reduced this past decade, is still a

persistent problem with over 2 billion tons eroded annually. Conversion of wetlands for use by agriculture has slowed, but millions of acres of wildlife habitat has been lost. More attention on nonpoint sources that impair the quality of water, nutrient and pesticides in farm and community wells, and loss of biodiversity in the ecosystem, can be expected. Debate builds on compaction of the soil strata, management of animal wastes, salinization, decertification, residues from chemicals, and whether agriculture itself is sustainable long-term.

Owners of private property question their role and rights in regard to endangered species, leading to conflicting views as to the best use of land and water. The continuing dialogue as to private rights vs. public responsibilities has evolved into revising the Fifth Amendment and potential "takings" without compensation. Historically, a corollary of the right to hold property has been a duty to refrain from using it in a manner that would cause harm or injury to neighboring landowners or the general public. Because the use of land invariably affects neighbors and the community health and welfare, absolute use has never been considered a protected property right. However, the action by technicians called on to identify and delineate the boundaries of soil for designation as highly erodible or as wetland, leads to tensions and uncertainty for agriculture, as well as those professionals long considered as farmer-friendly. Some regions are concerned about the loss of prime land. Clearly the unmet environmental agenda seeks solutions to assure future farm policy that also helps the environment.

What has been available to assist in solving problems?

The voluntary, incentive-based approach has been the primary method used by USDA to encourage private land users to also practice soil, water, and watershed conservation. Research and education, along with the innovative skills inherent in the agricultural sector, has resulted in an agricultural system for production of food as an unequalled achievement for increasing the ability and productivity of U.S. resources. The environmental linkage was established in the Conservation Title(XII) of the Food Security Act of 1985 (P.L. 99-198). The Sodbuster, Swampbuster, and Conservation Compliance provisions led to new rules and regulations setting conditions for the producers participating in the price and income programs. At the same time the Conservation Reserve Program offered those with highly erodible cropland an incentive to convert those acres to grass, trees, wildlife habitat, watershed protection, and water quality improvement by bidding for annual rentals through multi-year contracts with the Secretary. Nearly one-third of U. S. cropland is being impacted by these programs. Both the 1985 and 1990 Farm Bills had conservation Titles. Compliance provisions changed the rules of the game for the agricultural community, including several USDA agencies. Therefore, a social contract between society and agriculture has been tested for a decade. Legislation was enacted asking that those who use land and water for the production of food and fiber, and also participate in "farm programs", to also practice stewardship of the resources they own or manage, or be denied specified federal financial benefits. The balancing of incentives with regulations to achieve

conservation and environmental goals, on the nation's privately owned lands, is being monitored for results to assist decision-makers as they determine future agricultural and conservation policies. The desire of the public to protect and enhance the quality of the nation's natural resources, at the lowest cost to both producers and consumers, will continue to be a challenge. Thus far the achievements have been quite significant and should continue as many are finding soil stewardship rewarding. The widespread support for continuation of a Conservation Reserve Program, with the benefits of reduced soil loss and increased wildlife habitat and certain bird species is gratifying.

What about the future for lessening uncertainty?

The public concern about the quality of the environment has, according to recent polls, not been diminished and did not seem to be a matter deciding election results. In general the urban-suburbanite is concerned about the environment. During the last decade the media has widely covered children's exposure to pesticides used in food production and the quality of water sources for domestic uses. The Contract with America did not directly address environmental issues. However, recent strategy in the Congress, though not flat-out repeal of some environmental laws, may make implementation most difficult. The action on unfunded mandates is widely supported. The move to reform the regulatory process is embodied in H.P. 9. Question: Do Americans want fewer and weaker environmental laws? The 1995 Farm Bill debate will find this to be one of the issues.

Rather than a threat to agriculture an unmet environmental agenda is the foundation of a new social contract for both. *A Better Row to Hoe* released in December, 1994 by the Northwest Area Foundation, reports "American agriculture is trapped in a contradiction i. e. abundant food and deteriorating rural resources and communities. This contradiction is drawing increasing attention from society. Concerns about the environment, especially, play an even larger role in shaping farm policy. The hidden costs of agricultural abundance are increasingly borne by society, either directly, with economic and social programs, or indirectly, with regulation and other forms of government intervention". That report further states that, although farmers often bristle at unfair criticism suggesting they intended these results, many are also concerned about our food system. They want a farm that is not only profitable, but durable. The term sustainable agriculture can lead to debate about definition, but the kind of agriculture that many seek is usually termed sustainable agriculture. The President's Council on Sustainable development has recently created a group to examine this area with Secretary Rominger's help.

In August, 1994 *The Encyclopedia of the Environment* was published by the Houghton-Mifflin Company. The editors were Ruth A. and William R. Eblen, who also serve as Executive Director and President respectively, of The Rene Dubos Center for Human Environments. That awesome work is the first one-volume reference for the general reader to address the full range and complexity of environmental problems and issues. As a member of the advisory Board, I was privileged to suggest topics and authors for issues

related to agriculture and to conservation. In the 846 pages, the document incorporates the Five E's of Environmental Management: Ecology, Economics, Energy, Esthetics, and Ethics promoted by the late Rene Dubos. There are over 550 alphabetically arranged entries and over 60 charts, maps, graphs, and tables covering scientific terms and concepts ranging widely from A (Agriculture) to Z (Zoning). The authors wanted the book's contents written for those seeking answers to complex environmental problems and toward motivating readers to formulate policies for the resolution of environmental conflicts and for the creation of new environmental values. The rationale for citing this document was to assist in the need to understand that agriculture, as an important part of a much larger concern, the environment, has great responsibility for the long-term quality of both. Understanding environments became part of everyday language in the 1960's, compared to understanding agriculture dating to its beginning between 5000 and 9000 B.C. The meaning of the environment is far from clear and is evolving. At first it related to pollution, to depletion of resources, and to the impact of a growing world human population. Today, because of an increase in scientific knowledge, and a change in the mood of the general public, it emphasizes the positive qualities of environments-on those physical and social characteristics that contribute to the quality of life.

What more needs to be done to reduce uncertainty?

Agriculture in 1994 experienced record breaking crop yields in part because of favorable weather and in part because of the continuing advance in agricultural technology. Despite sagging prices USDA forecasts increased net farm income in 1994 of \$47-51 billion compared to \$43 billion in 1993. Farm debt is projected at \$141-145 billion, or only 16 percent of total farm assets, one of the lowest debt/asset ratios in 30 years. A portion of this favorable picture results from federal farm policy and federal funds.

Therefore, the system that supplies, and produces, the nation's food and fiber should accept the challenge that there can be damage to the environment when land and water is subjected to manipulation, even exploitation. Early public concerns were concentrated on accelerated soil erosion. It became an issue of national significance because of the possible loss of farm productivity as topsoil eroded from cultivated fields. Now, in contrast, sediments from erosion relate to water pollution. The effect on water quality, impacting aquatic life, lowering reservoir capacity, and other off-farm damages from soil loss led to non-point source pollution becoming a national issue. Agriculture has been identified as a major contributor to impaired quality of both surface and groundwater. Nutrients and pesticides attached to the eroding soils added to the concern about management practices used for producing crops.

For many decades agriculture was more a way of life than a business. The Jeffersonian ideal was a nation of family farm operators producing food, the most needed product of all. Those on the land were perceived to be God-fearing, the first to be defenders of our democracy, and a stabilizing element in all of society. Major exclusions were granted to agriculture.

Today the agricultural sector is still unique, having caused relatively less government intervention than other industries, wherein pollution has caused a plethora of regulations. However, the future may best be described by Dr. Don Paarlberg. A Purdue student asked Don this question, "What is the most important event that happened in agriculture in your lifetime". His answer, "The most important event is that agriculture is in the process of losing its uniqueness". To some extent this is well underway as the following list of laws enacted by Congress that can affect agriculture's operators is already quite daunting:

1. The Food Security Act of 1995,
2. The Coastal Zone Non-Point Pollution Program,
3. The Clean Air Act of 1990,
4. The Clean Water Act (1972, 1977, and 1989),
5. The National Pollution Discharge Elimination System,
6. The Insecticides, Fungicides, & Rodenticide Act,
7. The Toxic Substance Control Act, and
8. Section 404 of the Clean Water Act.

In addition there are numerous actions by some of the nonfederal governments that can cause more uncertainty. The 104th Congress may act to remove or lessen the impact of environmental regulations. There are those who represent agriculture voicing alarms that traditional voluntary, incentive-driven methods of assisting land users to practice stewardship will be replaced with more regulations to achieve society's environmental goals. As a soil conservationist for over five decades, my advice is to assist in elevating the quality and the health of soils used in agriculture as an issue of equal status with the quality of air and of water. The quality of soil can relate to many of the concerns of environmentalists. Poor water quality can be traced to poor quality of the soil in the contributing watershed. Poor quality soil can threaten a sustainable system for producing food and fiber. A nondegradation policy is needed for soil.

The environmental activists who have helped force recent debate about "greening" of agricultural practices will not be satisfied with land users defending some of the destructive processes driven by agriculture. However, if society expects landowners to be the nation's "Park-Keepers" how should they be rewarded for producing non-marketable benefits?

It may be timely to examine other sectors of the economy. As necessity is the mother of invention, three decades of environmental regulation have birthed and nurtured a huge American environmental industry. This industry's water treatment, air quality control, solid and hazardous waste handling elements now generate \$130 billion in sales annually and provides jobs for more than one million Americans. The farm sector benefits. Agriculture, and the industry that supplies its needs, has led to equipment for reduced tillage and thereby saving soil, toil, and oil. Chemicals are more targeted and the storage and disposal of pesticides has improved. The list is long and it is growing as research continues to assist agriculture to be cost-effective and more sensitive to the environment. Planning to anticipate the need for solutions to problems is available to producers through their local conservation

districts and others. There is a strong need to address agricultural related environmental problems at the local watershed level. Partnerships must be built between local, urban, conservation, and agricultural groups. People must agree they have problems and seek and define realistic solutions.

Gaining favor is Consolidated Farm Management Planning. USDA has a variety of programs that may require up to 15 separate plans. On a priority basis a comprehensive plan that assures a producer that their operations are acceptable, and that the rules will not change, is needed. Agriculture is seeking those to be trusted. In most states, there are locations that are "hot spots" that, unless properly managed, cause serious harm. New types of programs and new federal-state-local and private sector partnerships will be needed to assist agriculture to address environmental quality needs and lessen uncertainty.

An uncertainty that agriculture faces that may be more significant than any other issue, including environmental requirements, will be future federal budgets. Already having an impact on federal technical and financial assistance, the 1995 Farm Bill will debate the level of direct financial support for several sectors of agriculture related to the drive, over the next several years, for a balanced budget. Some will call for an elimination of all programs aimed at supporting farm income. That effort, aimed at having a market driven industry, has several advocates. A ten-year phase out of all federal commodity payments has been proposed. Others are suggesting that in lieu of presently designed programs, land users be rewarded for practicing stewardship of their resources that benefit the public. The greening of farm policy started a decade ago, would be strengthened by "green payments" for managing agricultural land as part of a larger ecosystem.

How best to integrate changing environmental concerns, with the other topics to be addressed by this panel, into a viable agricultural policy is an excellent question. I look forward to comments or questions from Tom Hebert. The other members of this panel will add to the knowledge needed as they examine agriculture's economic prospects through the year 2000.

Agriculture in an Uncertain Environment
Response to Comments Presented by Norm Berg

Thomas R. Hebert

Deputy Under Secretary, Natural Resources and Environment, USDA
1995 Agricultural Outlook Conference
February 22, 1995

We have an opportunity in the 1995 farm bill to help begin to heal a divisive split in this country -- a split that not only pits citizen against citizen, city dweller against the rural dweller, agriculturalist against the environmentalist, but also paralyzes us and prevents us from achieving the high levels of health and vibrancy in our natural landscape that we are capable of as a country. Mr. Berg mentioned a new social contract between agriculture and the country. I agree that a new contract is possible if it can be based in large part on a greater shared understanding of the natural resource and environment problems we face and the programs that will successfully address them. This is the opportunity before all of us now -- agriculture, the Administration, Congress, the environmental community, and we must try to not let it slip away.

To begin to heal this split, and help the country move forward, we must confront the very topic of this session, "uncertainty". Mr. Berg discussed many of these uncertainties, and if you stop to think about it, uncertainty leads to all kinds of problems. As a country we are uncertain about the true nature, extent and seriousness of our natural resource problems at the farm and ranch level. This uncertainty is compounded as we move away from the farm and field level as we try to understand how the problems at the local level add up to a total problem for the country. We know that there are issues that need to be addressed, and some of these we can describe in detail from a national perspective, but there is enough uncertainty that instead of moving forward with programs we remain stuck debating each other.

We are also very uncertain as a country about how to go about addressing these problems, once identified. The farmers and ranchers are very unsure about how the management practices and other changes that could help address the identified natural resource issues will affect their profitability. They are understandably nervous about this. As a result, agriculture wants programs and policies that are flexible, and very responsive to local conditions and needs. The environmental community, on the other hand, is very uncertain about what agriculture will do with this flexibility -- will the adoption of solutions be put off in the name of uncertainty, or will flexibility be used to render the adopted solutions ineffective?

By this, I do not mean to imply that we have been in the dark on some of the most pressing natural resource issues. We have tackled soil erosion and many of the attendant water quality problems in this country, and made major and dramatic headway. The same is true for flood water management issues in small watersheds, the loss of wetlands and some wildlife habitats.

But problems in these and other important areas continue to exist, and there is no question that they need to be addressed.

The question is, how do we deal with this uncertainty -- and fill the void created by the lack of information -- so that a new understanding and contract is possible?

There are several things we can do right now, with help from the farm bill, to reduce the uncertainty we face and help us to proceed. The principles of reinventing government that this Administration and Congress are discussing point the way.

There is no question that we have a solid general sense in this country about the important problems we face -- water quality, wildlife habitat, watershed restoration and floodwater management. The first practical step in reducing our uncertainty would be for the Department to set national standards and guidelines for the identification of these problems as they are uniquely expressed at the local level. Flexibility would be needed at the local level for the use of these guidelines. National and state standards and guidelines are also needed for how to organize and plan for the natural resource work needed to solve these problems.

With these in place, the Department could rely on our agencies at the local level, working in partnership with private landowners and the other stakeholders in these communities, to tell us what exactly are the natural resource problems they believe need to be addressed, and how they would go about this work. The agencies would work with the stakeholders to develop specific action plans for systematically addressing these identified problems with the accepted solutions. These plans of work would also need to include reporting and evaluation elements that would allow for meaningful performance measurement. The state level of the agencies would work with their regional and national offices to evaluate the projects and prioritize among them so that the national funds made available for this effort would be spent in the most effective and efficient manner possible.

The bottoms-up plans would then be aggregated to identify first state, then regional, then national plans of work. The state, regional and national plans of work would be guided by the national standards and guidelines that could specify the broad classes of natural resource issues that Appropriations from Congress could be guided by these national plans of work, and in this way Congress would be involved in the prioritization of the activities that would receive funding.

The point is, we need to develop a model that can fill in the gaps of information that lead to so much uncertainty and divisiveness. This is one model that the Department believes has considerable merit, and if adopted could help us forge a new contract and bring to an end some of the most destructive divisiveness that is stopping us from doing the work that needs to be done.

AGRICULTURE IN AN UNCERTAIN POLICY ENVIRONMENT: TRADE ISSUES

I. INTRODUCTION

- The 1995 Farm Bill debate and the building budget deficit debate present "an opportunity that cannot be ignored" for a thorough-going review of our international trade policy for agriculture, especially for developing a new, long view.
- This conference session is aptly titled. Today's policy environment resembles 1985 in its "uncertainty quotient," and will result in the most dynamic debate in a decade. It is characterized by all the usual economic uncertainty, with the added dimension of an unprecedented political upheaval. In addition, it comes on the heels of a geo-political revolution in the first half of the decade that saw the collapse of socialism and the emergence of fledgling democracies and market economies in many parts of the world, successful conclusion of the Uruguay Round GATT accord, creation of the North American Free Trade Agreement, expansion of the European Union, and numerous new alliances, buoyed by the resurgence of world economic growth..
- The 1995 farm bill consideration also comes at a time marked by a "New World Trade Order". This derives in part from the Uruguay Round GATT accord, the first in history to include agriculture, from the creation of NAFTA and other regional trading blocs. But, it is much more. It is a new mindset that embraces new concepts and a new language (GATT-legal, Greenbox, etc.). The order is characterized by a reduced role for government in agriculture, for less intrusive and less costly programs. This conviction extends from Western and Central Europe to Latin America, the Caribbean, certainly to the United States, and to elsewhere.
- Taken together, these trends mean that the 1995 farm bill is being developed at a time of "sea changes" in the government role versus that for markets. Greater reliance around the world is being placed on markets and less on governments in the agriculture sectors and food systems.
- This also is a time when the long-term market outlook and the prospects for global agriculture trade are very favorable, especially for high-value products, perhaps the most favorable outlook in almost two decades. This provides a strongly supportive backdrop against which to consider diminishing government support for agriculture. But, countries all across the world are looking at the same backdrop, highlighting the role of competitiveness in the future.

My remarks today will:

- first review briefly the importance of foreign markets to the U.S. agriculture and food system;

Notes for remarks by J.B. Penn, Senior Vice President, Sparks Companies, Inc. at the USDA's Agricultural Outlook Forum, Washington, DC, February 22, 1995.

- discuss briefly the foreign market outlook for the next several years; and
- then suggest some of the issues that merit consideration in development of long term trade policy.

II. IMPORTANCE OF FOREIGN MARKETS

Strong reliance on the foreign markets is a relatively recent development for U.S. agriculture and our food system. By the early 1970s, less than 25 years ago, agricultural exports amounted to only \$8.0 billion annually. The now famous export boom of the 1970s boosted that to an incredible peak of \$44 billion by 1981. The equally famous export market bust that dominated the 1980s saw export sales values plummet (to \$26 billion in 1986) before slowly returning to the former peak only this year. The result, for the 1980s, was the deepest farm recession since the 1930s.

At the height of the mid-1980s recession, with exports at their nadir, the key philosophical policy debate concerned the role of foreign markets in the future of U.S. agriculture and the importance of being competitive. That debate was settled decisively and its outcome defined many of the key provisions of the 1985 farm bill, the Food Security Act, and placed U.S. agricultural policy on a path toward greater market orientation and greater reliance on the foreign markets.

Today, it is difficult to overstate either the importance of those markets or the disruption and dislocation that would follow their loss. Today's \$45 billion agricultural export level also represents a key positive contribution to the nation's overall trade balance and accounts for substantial employment in the food system. For certain commodities and products, overseas sales represent major and growing share of total production, especially of food grains. Of our major field-crop commodities, we export:

Wheat	56%
Rice	45
Soybeans	31
Feed Grains	20

Overall, in 1994/95 we will export bulk commodity production from about 80 million acres, some 34% of our entire cropland area. It is abundantly clear that without our growing export markets, we would face the prospect of idling fully one-third and perhaps more of our agricultural production plant.

But, the importance does not end with the crop commodities. Today, exports now account for significant and growing proportions of the total output of high-value products (some little exported at all until very recently). We now rely on overseas markets for:

Broilers	12%
Beef	7
Turkeys	5
Pork	3

To summarize, exports account for more than one-fourth of gross farm sales, one third of the major field crop acreage, very sizable and growing shares of income and employment in the food system and a major, positive contribution to the trade balance. One could continue with such statistics but the point is clear that the foreign markets are not only highly important to the U.S. agriculture and food system but also represent the most dynamic segment and most likely source of future growth.

III. FOREIGN MARKET OUTLOOK

The global market outlook for the foreseeable future for food and agriculture is now more favorable than at any time in the past fifteen or so years. This optimism traces largely to expected synchronous economic (GDP) growth in most major developed and developing economies around the world, a very rare occurrence for perhaps the first time in the post-war period. Positive economic growth means rising consumer incomes which in turn boost demand for food--not only through increased consumption but also by dietary improvement--and more processed and high value foods.

This favorable economic outlook is reinforced by the new GATT agreement which is expected to further increase GDP expansion significantly, especially toward the latter part of the implementation period.

USDA's long-term outlook already has been presented to this conference. Drawing upon that view, together with projections by SCI and others, provides several highlights including:

- World grain and oilseed trade is growing faster in the 1990s than in the 1980s and accelerating after 2000 based heavily on income growth stimulated by the GATT accord.
- U.S. agricultural exports rising from \$43.5 billion in FY 1994 to \$55 billion in 2000 and exceeding \$68 billion by 2005.
- U.S. exports projected to grow 7-plus % in 1995, slow slightly in 1996 and 1997, and then exhibit strong growth in 1998 and to the end of the period. Very rapid overall, average annual growth of 3.9% is expected from 1995 to 2005.

- High value exports are projected to grow nearly 5% annually between 1995 and 2005. Bulk export growth of 1.6% through 2000 and 4.2% thereafter is expected.

	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>% growth 1995-2005</u>
Total agricultural exports	46.5	54.5	68.1	3.9
Bulk commodities	19.1	20.7	25.4	2.9
High-value products	27.4	33.8	42.7	4.7

These projections reflect the broad restructuring that occurred in the U.S. farm sector in the 1980s and the emergence of a much more efficient production plant. They also reflect a leaner, more competitive agribusiness sector developed in the early 1990s. In short, the entire U.S. farm and food system now is increasingly competitive at a time when the outlook for more open, growing global markets is highly positive.

The importance of this backdrop to the farm bill and trade policy consideration is clear. One can expect less government support for agriculture and a declining role in the United States (and elsewhere in the world) for a range of economic and political reasons, not the least of which is the sector's need for less support today. Simultaneously, markets are going to be relied upon more and more to take up the slack, especially during the transition period, a dynamic that could stimulate growth independently as government intervention declines. This policy view already is becoming apparent as we enter the early stages of the farm bill debate.

Such a prospect makes it vitally important that the U.S. farm and food system capture an increasing share of the expected market growth. It underscores the need to be competitive, and to ensure that our policies do not interfere with or impede competitiveness, not only in the farm sector but throughout the food system. Hence, now is a good time to review the U.S. trade policies.

IV. KEY ISSUES

Today, U.S. agriculture has the luxury of considering long-term rather than only the short-term issues that normally dominate farm bill debates. In that context, the principal concern of our trade policy for the foreseeable future, especially that embodied in the 1995 farm bill, will concern **competitiveness**. The new law must ensure that both our farms and the entire food system are not constrained as they compete to expand their share of the global markets. Discussion along these lines is not new--reviews of how current policies will affect competitiveness in the future have been building widely--and interest is centered on a few broad areas including our domestic commodity programs, environmental and other regulations, and the market development and

expansion programs. The remainder of this section will discuss a view of our policies from that perspective.

Domestic Commodity Programs

Various forms of both price and income supports and the supply controls necessary to manage them long have been central policy features. That long experience has yielded ample and widely accepted evidence that despite good intentions and some positive benefits, these programs generate a wide array of unintended consequences and have increasingly important development drawbacks for farmers and the entire food system. Especially, they limit foreign trade and competitiveness.

- There is overwhelming evidence that our programs distort farmers' decisions, cause expensive misallocation of resources, place U.S. farmers at a competitive disadvantage in world markets, and, frequently, undermine the U.S. market position by signaling foreign competitors that U.S. crop output will be constrained and prices higher.
- Price supports above world market clearing levels price our products out of many world markets, reduce market share, and accumulate expensive carryover stocks.
- Acreage idling programs raise production costs and spread fixed expenses over fewer acres. They encourage uneconomical input use (further raising costs), and may have unintended adverse environmental effects which invite subsequent environmental regulation which too may add to higher costs. They also have been criticized for their secondary effects on economic activities and rural communities.
- Annual idling programs (ARPs) have been used less in recent years, due in part to the fact that some 36 million acres are idled under long-term contracts in the Conservation Reserve Program. While the extension of that program now is under consideration, the long-term ERS market outlook clearly indicates that the U.S. competitive position will be impaired if that much acreage is reenrolled for another long-term period, reducing our ability to meet growing demand.
- Program benefits eventually are bid into asset values raising the cost base for new and expanding farmers, again placing them at a disadvantage to foreign producers.
- Today's programs continue to damage the U.S. commodity related infrastructure, and to raise feed costs reducing competitiveness of the growing value-added markets for meat and poultry products.

Environmental and Other Regulations

Commercial agriculture's role in protecting our environment now has been a central feature of agricultural policy for more than a decade. Recognition that environmental programs and regulations have broad implications, beyond the local problem being addressed, are growing, as

well. These include costs of compliance by farmers, processors, handlers, and others in the food system and their ultimate effect on foreign market competitiveness, especially in markets where competitors may have much lower environmental standards. This realization is leading to suggestions that environmental policy be viewed in a more global context, concerning not only relative production costs but also global resource use (forests, prairies, etc.). And, it is leading to calls for greater evaluation of the costs and benefits of future proposed regulations. Both concerns are fundamentally important and can be expected to receive widespread attention in the upcoming debate.

Market Development and Export Expansion Programs

The global trade picture and especially prospects for U.S. product access to growing world markets were buoyed by the recently concluded trade agreements (Canadian Free Trade Agreement, NAFTA and GATT). The ability of U.S. exporters to take advantage of these opportunities will depend on several factors, including the value of the dollar and especially the nature of U.S. market development and export support. The major manifestations of that policy now are contained in familiar programs (EEP, GSM, MPP, and PL-480). The circumstances surrounding all of these programs have changed significantly over the years and, now, in light of the new economic backdrop and the current fiscal climate, would appear to be a propitious time for their reappraisal. The task in refocusing these programs is to make them consistently support long-term market growth.

Export Enhancement Program. First authorized in the 1985 farm law, this program targeted "unfair trading practices" of major competitors, especially the EU. It was subsequently extended in the 1990 farm bill (through expansion of DEIP, SOAP and COAP). These programs were extended until 2001 in the Uruguay Round implementing legislation (and the requirement that they be used exclusively to discourage unfair trade practices removed). Specific Uruguay Round restrictions constrain both outlays and volume of commodities subsidized.

This program has been controversial from the outset and continues to be, with recent calls by Congressional leaders for its immediate termination. The continued availability of export subsidies by trading partners reflects a serious shortcoming in the Uruguay Round. The current debate is polarized between those who suggest that these subsidies are no longer needed and others that argue that they must be utilized to the fullest allowable extent. Apart from this debate is the much larger issue of how these programs fit into an overall, long-term export expansion and promotion policy and what the form and expenditure levels should be.

Market Promotion Programs. This program and the Foreign Market Development Program ("Cooperator" program) was continued in the 1990 law to provide shared federal funding for overseas market development activities by commodity and food trade associations and companies. They too have been questioned regarding their overall efficacy, manner of operation, fund use, concentration on bulk (versus value-added) products, and even whether taxpayer dollars were more effectively spent promoting exports from other sectors rather than agricultural exports. The larger issues also loom here--how will these programs fit into the overall export promotion and market development policy.

Export Credit Programs. These credit guarantee programs provide efficient short and intermediate-term support for overseas sales to buyers unable to access credit through normal commercial channels, and have important restrictions attached to their use. However, the efficacy of these programs also is questioned from time to time and issues will be raised again in the upcoming debate. Key concerns will include costs and benefits of additional credit resources for exports and the federal government's budget exposure in such efforts.

Food Aid Programs. These programs [PL-480, the Food for Peace Act traces to 1954 and section 416(b) of the 1949 Agricultural Marketing Act] were modified in the 1990 farm law and their goals and administration clarified somewhat. But even so, both programs will be questioned seriously in the 1995 debate, especially in terms of their effectiveness in building commercial markets.

Food aid has been an important but declining component of U.S. development assistance. In fact, these programs were most important when we had chronic commodity surpluses and a much clearer foreign assistance objective to meet the global communist threat. Today, we no longer have chronic surpluses nor the communist threat, leading some to suggest that their very rationale be reviewed just as our overall national foreign economic assistance objectives and rationale are being reassessed. In addition to this overarching issue, funding levels and the continued use of "cargo preference rules" likely will be points of contention for these programs.

Lingering and Emerging Issues. While much of the farm bill/trade policy debate will center around the programs and issues discussed above, there are lingering issues that need special consideration. One example is the festering trade dispute with Canada. Additionally, a host of new issues are emerging involving the interpretation of the Uruguay Round GATT provisions, expansion of the NAFTA trading bloc and the scope of any fast track authority granted to the Clinton Administration, and many others.

As we consider now the longer term view of each of our programs, it is clear the change in concept must be kept simple if it is to succeed. In simplest terms, we need to insure that we preserve the aspects of our policy that are working and convert the system in its entirety from surplus disposal to commercial market development, the 21st century view.

V. SUMMARY

- The 1995 farm bill provides an opportunity to review our international trade and related policies, especially given the significant changes that have occurred and the new, highly unsettled political environment
- Foreign markets are highly important to U.S. agriculture, the food system, and the national economy, and will become increasingly so in the years ahead.

- For the longer haul, competitiveness will be the key to maintaining and increasing global market share. Governments play a big role in that contest, and we must ensure that our policies facilitate rather than impede our growth.
- Key areas of government policy for review are: domestic commodity programs; market development and promotion programs; environmental and other regulations; and lingering issues along with emerging ones. Budget issues are important. How we ensure competitive U.S. market access in the future is even more important.
- This also may be an opportune time to take advantage of a particular circumstance--declining domestic support for agriculture against a backdrop of growing global markets. Similar developments in the United States, the European Union and other important trading nations could build upon the momentum developed during the Uruguay Round to resume negotiations for further reductions in domestic subsidies (and even supports), and greater market access. Times like these may not soon return.

REMARKS OF
AMI PRESIDENT J. PATRICK BOYLE
BEFORE THE
AGRICULTURE OUTLOOK CONFERENCE
FEBRUARY 22, 1995
3:00 P.M.

GOOD AFTERNOON. IT'S A PLEASURE TO BE HERE TODAY TO TALK ABOUT THE FOOD INDUSTRY'S PERSPECTIVE ON HEALTH AND SAFETY.

GIVEN THAT THIS IS AN "OUTLOOK" CONFERENCE, LET ME SUGGEST THE FOLLOWING "OUTLOOK" TO YOU: I BELIEVE THAT WE ARE AT THE BEGINNING OF A FUNDAMENTAL SHIFT IN THE RELATIONSHIP BETWEEN GOVERNMENT AND THE INDIVIDUAL CITIZEN, BETWEEN THE REGULATOR AND THE REGULATED, AND BETWEEN USDA AND THE MEAT AND POULTRY INDUSTRY THAT IT OVERSEES.

I BASE THIS "OUTLOOK" ON WHAT I BELIEVE IS A REASONABLE INTERPRETATION OF LAST NOVEMBER'S ELECTION: THAT THE AMERICAN ELECTORATE WANTS LESS AND MORE EFFICIENT GOVERNMENT AND THAT IT WANTS GREATER LOCAL CONTROL AND GREATER INDIVIDUAL FREEDOM. THESE ARE THE FUNDAMENTAL PREMISES ON WHICH OUR COUNTRY WAS FOUNDED AND THEY ARE THE KEYS TO THE INNOVATION AND INGENUITY THAT ARE THE HALLMARKS OF AMERICAN INDUSTRY.

WE KNOW A FAIR AMOUNT ABOUT REGULATION IN THE MEAT AND POULTRY INDUSTRY, PERHAPS, MORE THAN ANY OTHER SEGMENT OF THE ECONOMY BECAUSE WE ARE SO INTENSIVELY AND HEAVILY REGULATED BY THE FEDERAL GOVERNMENT.

I THINK THERE ARE MANY REASONS FOR THIS LEVEL OF REGULATORY OVERSIGHT, ENOUGH TO FILL A RATHER LENGTHY SPEECH; HOWEVER, THERE ARE TWO THAT COME TO MIND. IN MANY RESPECTS, I THINK WE HAVE OURSELVES TO BLAME.

FIRST, I THINK WE ARE PARTLY THE VICTIMS OF OUR OWN TECHNOLOGICAL ADVANCEMENTS AND SUCCESSES. FOR EXAMPLE, THOSE OF YOU WHO HAVE BEEN IN THE FOOD INDUSTRY FOR MANY YEARS WILL REMEMBER THAT WE WERE QUANTIFYING CANCER-CAUSING ADULTERANTS IN FOOD IN PARTS PER MILLION JUST A FEW DECADES AGO. IN THE EIGHTIES WE GOT TO PARTS PER BILLION. NOW WE CAN QUANTIFY THOSE RISKS IN PARTS PER TRILLION. WITH SUCH INCREASING SCIENTIFIC SOPHISTICATION MORE AND MORE OF WHAT WE EAT COULD CONCEIVABLY BE FOUND TO CONTAIN A QUANTIFIABLE CARCINOGENIC RISK -- HOWEVER MINUTELY REMOTE.

ALSO, I THINK OUR NATION'S ECONOMIC PROSPERITY HAS FUELED THE BELIEF THAT WE SHOULD RISK LESS AND LESS IN OUR SOCIETY, MOVING US TOWARDS THE UTOPIAN STANDARD OF RISK-FREE EXISTENCE. 19TH CENTURY AMERICAN AUTHOR RALPH WALDO EMERSON -- WHO HAD SOME FLIRTATIONS WITH UTOPIAN CONCEPTS AT WALDEN POND -- RECOGNIZED THAT "AS SOON AS THERE IS LIFE, THERE IS DANGER."

AND AS THE 20TH CENTURY COMES TO A CLOSE "DANGER" OR RISK IS AN INCREASINGLY FASHIONABLE TOPIC OF DISCUSSION OR -- MORE PRECISELY -- THE NEED TO ACHIEVE A LOGICAL AND RATIONAL BALANCE BETWEEN REGULATING RISKS AND MAXIMIZING BENEFITS.

LAST SPRING, *NEWSWEEK* REPORTER ROBERT SAMUELSON FOCUSED UPON OUR QUEST FOR A RISK FREE SOCIETY. HE WROTE, "WE FEEL THAT IDENTIFIABLE RISKS SHOULD BE AVOIDABLE RISKS. WE ACT AS IF THERE IS A CONSTITUTIONAL RIGHT TO IMMORTALITY AND THAT ANYTHING THAT RAISES RISK SHOULD BE OUTLAWED. OUR GOAL IS A RISK-FREE SOCIETY AND THAT GOAL FOSTERS A LOT OF OUTSIZED FEARS."

AND IN RECENT DECADES, THESE OUTSIZED FEARS HAVE FOSTERED NUMEROUS LAWS AND REGULATIONS -- ALBEIT WELL-INTENTIONED -- EMANATING FROM THE FEDERAL, STATE AND LOCAL LEVELS.

TODAY, AMERICANS ARE LITERALLY DROWNING IN REGULATORY COSTS AND REQUIREMENTS. SINCE 1960, THE NUMBER OF U.S. REGULATORY AGENCIES HAVE DOUBLED. THE NUMBER OF PAGES IN OUR *FEDERAL REGISTER* HAS GONE FROM 15,000 PAGES A YEAR IN 1963, TO 70,000 PAGES AT THE END OF THE BUSH ADMINISTRATION.

THE CLINTON ADMINISTRATION NOW ESTIMATES THAT COMPLIANCE COSTS IMPOSED BY THESE FEDERAL REGULATIONS COST THE PRIVATE SECTOR OF THE UNITED STATES \$430 BILLION EVERY YEAR. THE ROCHESTER INSTITUTE OF TECHNOLOGY ESTIMATES IT CLOSER TO \$500 BILLION A YEAR. THAT'S 10 PERCENT OF AMERICA'S GROSS NATIONAL PRODUCT ABSORBED IN COMPLYING WITH REGULATORY REQUIREMENTS.

THE U.S. SMALL BUSINESS ADMINISTRATION ESTIMATES THAT SMALL BUSINESSES IN OUR COUNTRY SPEND AT LEAST A BILLION HOURS A YEAR FILLING OUT FORMS.

MANY REGULATORY EXCESSES AND ABSURDITIES ARE CHRONICLED IN A RECENT BESTSELLER -- APPROPRIATELY NAMED, I BELIEVE -- *THE DEATH OF COMMON SENSE*, BY NEW YORK CITY LAWYER PHILLIP HOWARD.

FROM THE BOOK, LET ME GIVE YOU A FEW EXAMPLES OF WHAT FORMER EPA ADMINISTRATOR WILLIAM RILEY CALLS REGULATIONS BY "EPISODIC PANIC." LET ME BEGIN WITH A FEW EXAMPLES IN THE ENVIRONMENTAL AREA FROM MR. RILEY'S FORMER AGENCY, AN AREA OF INCREASING REGULATORY COSTS TO MEAT AND POULTRY COMPANIES.

EXAMPLE 1: IN THE 1970'S A STUDY INDICATED THAT ASBESTOS, WHEN INHALED, MAY CAUSE LUNG CANCER. SO EPA BANNED ASBESTOS AND ORDERED ITS REMOVAL FROM BUILDINGS. THE RISK OF DYING FROM ASBESTOS IS 1 IN 11 MILLION AND THE COST OF REMOVING ASBESTOS FROM THE INSULATION OF EXISTING BUILDINGS TRANSLATED TO \$1.4 BILLION PER EACH LIFE PROLONGED.

ANOTHER EXAMPLE: EPA BANNED CHLOROFORM EMISSIONS FROM SMOKESTACKS OF 48 PULP MILLS AT COST OF \$99.3 BILLION DOLLARS PER LIFE SAVED.

IN FACT A STUDY JUST COMPLETED BY HARVARD UNIVERSITY ESTIMATES THAT ALL EPA REGULATIONS IMPOSE AN AVERAGE COST \$7.6 MILLION PER YEAR, EVERY YEAR, FOR EVERY LIFE PROLONGED.

ADMITTEDLY, ENVIRONMENTAL REGULATIONS HAVE ACCOMPLISHED MUCH GOOD IN THE 2 DECADES SINCE EPA WAS CREATED; HOWEVER, HAVING SPENT AN ESTIMATED ONE TRILLION DOLLARS OVER 20 YEARS, DON'T YOU THINK WE WERE BOUND TO CLEAN UP SOME THINGS?

ANOTHER EXAMPLE OF A WELL INTENTIONED LAW AND REGULATIONS ATTEMPTING TO ADDRESS RISKS INVOLVES WORKER SAFETY AND HEALTH. IN 1970, THE CONGRESS CREATED THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION. TODAY, OSHA HAS 4,000 DETAILED REGULATIONS, INCLUDING REGULATIONS THAT DICTATE THE HEIGHT OF RAILINGS IN WORKPLACES, AND HOW MUCH A PLANK CAN STICK OUT IN TEMPORARY SCAFFOLDING. OSHA HAS 140 REGULATIONS THAT EFFECT WOODEN LADDERS.

IRONICALLY, MORE THAN HALF OF ALL THE OSHA VIOLATIONS THAT ARE RECORDED EVERY YEAR INVOLVE RECORDKEEPING, HAVING NOTHING DIRECTLY TO DO WITH IMPROVING WORKPLACE SAFETY OR REDUCING INJURIES AND ILLNESSES.

NO WONDER, ACCORDING TO BUREAU OF LABOR STATISTICS, WORKPLACE SAFETY IN AMERICA IS ABOUT THE SAME TODAY AS IT WAS IN 1970 BEFORE OSHA BEGAN PROMULGATING THOSE 4,000 REGULATIONS.

NOT SURPRISINGLY, 80 PERCENT OF ALL EPA REGULATIONS THAT HAVE BEEN PROPOSED OVER THE LAST TWO DECADES AND 96 PERCENT OF ALL OF OSHA'S 4,000 REGULATIONS, HAVE BEEN CHALLENGED BY AFFECTED PARTIES IN OUR COURT SYSTEM.

OCCASIONALLY FOOD INDUSTRY ASSOCIATIONS EVEN FEEL COMPELLED TO GO TO COURT TO CHALLENGE FSIS REGULATIONS.

OF COURSE, A BEST SELLER BOOK ABOUT REGULATORY EXCESSES AND ABSURDITIES WOULDN'T BE COMPLETE WITHOUT SOME REFERENCES TO MEAT AND POULTRY REGULATIONS.

IN THE DEATH OF COMMON SENSE, THE AUTHOR WRITES ABOUT A SMALL MEAT PACKER IN SPRINGFIELD, OREGON WHO HAS RUN HIS BUSINESS FOR 33 YEARS. USDA ASSIGNS ONE FULL-TIME INSPECTOR TO HIS PLANT AND ONE HALF-TIME INSPECTOR. THE RULES REQUIRE THAT THERE BE AT LEAST ONE INSPECTOR PRESENT WHEREVER LIVESTOCK IS SLAUGHTERED, SO THE LEVEL OF USDA STAFFING IS NOT SURPRISING FOR A MEAT PLANT, BUT WHAT IS SURPRISING IS THE RATIO OF INSPECTORS TO WORKERS. THE PLANT HAS ONLY FOUR EMPLOYEES.

PERHAPS THAT PARTICULAR PLANT POSES A SIGNIFICANT THREAT TO PUBLIC HEALTH THAT JUSTIFIES A NEARLY 2 TO 1 RATIO BETWEEN EMPLOYEES AND INSPECTORS; ON THE OTHER HAND, PERHAPS NOT. HOWEVER, CURRENT LAWS AND REGULATIONS DO NOT GIVE THE DEPARTMENT ANY CHOICE IN THE MATTER OR ANY OPPORTUNITY TO EXERCISE SOME DISCRETION OR "COMMON SENSE."

LAST SPRING, ABC NEWS AIRED A PRIME TIME REPORT ABOUT OUR COUNTRY'S OBSESSION WITH RISK. ENTITLED "ARE WE SCARING OURSELVES TO DEATH?", REPORTER JOHN STOSSEL CONCLUDED: "WE'VE BEEN TOLD BY POLITICIANS AND THE MEDIA THAT THERE IS DANGER EVERYWHERE, AND IT IS GETTING WORSE. THE FACT IS THAT'S JUST NOT TRUE. WHAT I HAVE LEARNED AS A REPORTER ON THIS SHOW IS THAT THE RISKS WE IN THE MEDIA SPEND THE MOST TALKING ABOUT ARE NOT USUALLY THE BIGGEST THREATS."

PERHAPS, IN ADMIRABLE PURSUIT OF CREATING A RISK FREE UTOPIA, COMMON SENSE HAS DIED A SLOW AND PAINFUL DEATH AT THE HANDS WELL INTENTIONED LEGISLATORS AND REGULATORS. WHEN THE LATE PRESIDENT TRUMAN WAS PREPARING HIS BIOGRAPHY, HE TOLD HIS BIOGRAPHER ABOUT THE GREENS THAT HE USED IN MAKING A COUNTRY SALAD: TURNIPS AND DANDELIONS. TRUMAN CAUTIONED HIS BIOGRAPHER THAT CERTAIN GREENS, LIKE POKE ROOTS, HAD TO BE PICKED AT JUST THE RIGHT TIME BECAUSE IF YOU PICKED THEM AT THE WRONG TIME, THEN "YOU MIGHT AS WELL ORDER YOUR COFFIN; YOU'RE DONE."

THE BIOGRAPHER WANTED TO KNOW HOW TRUMAN KNEW WHEN TO PICK THE POKE ROOTS. THE FORMER PRESIDENT REPLIED, "YOUR GRANDMOTHER HAD TO TELL YOU." TODAY, IT SEEMS THAT EITHER GRANDMA ISN'T TALKING OR THE GRANDKIDS AREN'T LISTENING.

WE SEEM TO HAVE ACHIEVED, AS ATTORNEY/AUTHOR PHILLIP HOWARD PUTS IT, THE WORST OF BOTH WORLDS: A SYSTEM OF REGULATION THAT GOES TOO FAR, WHILE IT DOES TOO LITTLE.

HOWARD'S DESCRIPTION IS, IN MY VIEW, AN APPROPRIATE EPITAPH FOR A ONE HUNDRED YEAR OLD MEAT AND POULTRY INSPECTION SYSTEM DESPERATELY IN NEED OF MODERNIZATION.

WHILE MOVING FROM A VISUALLY BASED, SUBJECTIVE, LABOR INTENSIVE AND VERY EXPENSIVE SYSTEM -- \$1.5 MILLION PER DAY -- TO A SYSTEM THAT IS SCIENCE AND RISK-BASED -- IS A SIGNIFICANT -- AND POLITICALLY INTRIGUING -- UNDERTAKING, I BELIEVE THAT THE "OUTLOOK" FOR ACHIEVING MEANINGFUL REFORM OVER THE NEXT FEW YEARS IS FAVORABLE.

AT THE AMERICAN MEAT INSTITUTE WE BELIEVE THAT THE 1906 FEDERAL MEAT INSPECTION ACT AND THE 1957 POULTRY PRODUCTS INSPECTION ACT SHOULD BE REPEALED AND REPLACED WITH A SINGLE STATUTE COVERING MEAT, POULTRY AND SEAFOOD.

THE NEW STATUTE SHOULD EXTEND FEDERAL INSPECTION AUTHORITY BEYOND SLAUGHTER AND PROCESSING FACILITIES; BACK TO THE FARM AND FORWARD THROUGH THE RETAIL AND FOODSERVICE ESTABLISHMENTS.

THE NEW STATUTE SHOULD DIRECT FUTURE USDA INSPECTION TOWARDS A RISK-BASED SYSTEM IN WHICH THE LEVEL OF INSPECTOR PRESENCE IS DETERMINED BY FSIS ON A PLANT-BY-PLANT BASIS; HOWEVER, A CONTINUOUS INSPECTION PRESENCE WOULD BE REQUIRED IN ALL SLAUGHTERING OPERATIONS.

THE NEW STATUTE WOULD DIRECT FSIS TO REQUIRE INDUSTRY TO DEVELOP AND IMPLEMENT A SCIENCE-BASED HACCP SYSTEM, SUBJECT TO FSIS MONITORING AND VERIFICATION. THE DETAILS OF THE SYSTEM SHOULD BE DEVELOPED THROUGH RULEMAKING -- WHICH FSIS HAS RECENTLY EMBARKED AND FOR WHICH I COMMEND ACTING UNDER SECRETARY MICHAEL TAYLOR FOR HIS LEADERSHIP.

WHILE THE IDEAS ABOUT THE DETAILS OF REFORM MAY VARY, THE OBJECTIVE OF INDUSTRY AND GOVERNMENT SHOULD BE THE SAME: TO ENSURE A SAFE, ABUNDANT AND RASONABLY PRICED PRODUCT FOR CONSUMERS, WHICH IN TURN PROMOTES THE HEALTH OF THE INDUSTRY AND OUR NATION'S ECONOMY.

AS 18TH CENTURY WRITER EDGAR HOWE SAID, "COMMON SENSE IS COMPELLED TO MAKE ITS WAY WITHOUT THE ENTHUSIASM OF ANYONE." PERHAPS SO; HOWEVER, MANY OF US IN THE MEAT AND POULTRY INDUSTRY ARE ENTHUSIASTIC ABOUT MODERNIZING THE FEDERAL INSPECTION SYSTEM.

AS I STATED AT THE OUTSET, I BELIEVE THAT WE ARE AT THE BEGINNING OF A FUNDAMENTAL SHIFT IN THE RELATIONSHIP BETWEEN USDA AND THE MEAT AND POULTRY INDUSTRY THAT IT OVERSEES. I, ALSO, BELIEVE -- ENTHUSIASTICALLY -- THAT THE "OUTLOOK" FOR MEANINGFUL REFORM IS A FAVORABLE ONE.

THANK YOU.

Wednesday, February 22, 1995

SET THE CAPTIVES FREE

Peter C. Myers Sr.
President, Myers Land Management Co.

One of the greatest myths in the United States is that we have truly independent farmers and ranchers. In reality most United States agricultural producers are bound up by federal farm programs and/or regulations.

Major row crop farmers are dictated to by federal farm programs which tell them the types and acreages of the crops they may raise. Many hours are spent at the local Consolidated Farm Service Agency (CFSA) offices by farmers in all the row crop areas of our country.

Farmers and ranchers are also regulated by USDA, EPA, OSHA, Corps of Engineers, F&WLS and state DNR's to mention a few. Swampbuster and the Endangered Species Act further attack the rights of private land owners. The list is seemingly endless. Some regulations are necessary for discipline within the agricultural industry and some may well be justified for the common good of the citizens of our country. Some regulations have been brought on by reactions to the carelessness of a handful of agricultural producers or handlers of their products. However, many regulations are imposed by an environmentally sensitive society which expects at the same time to have food and fiber produced at relatively low prices in the consumer marketplace.

In truth, farmers need freedom to competitively produce food & fiber for our country and the world. Produce they will if given a chance and the incentive to do so. They need to be able to do this in a relatively unregulated manner, with supply and demand being the basic motivator for what, how much and the quality of their production. Consumers will expect and pay for wholesome, quality end products to feed, clothe, and house themselves.

I personally don't care for federal farm programs and the restrictions (or coercion through payments) they bring to many farm operations. Farmers have long ago factored farm program payments and accompanying regulations into their farm operations & financial planning. Most farmers I know would prefer to secure their prices from the market place. However with our major competitors in the world producing in a subsidized and/or protected atmosphere it is difficult to economically compete on that proverbial "level playing field".

I realize that the United States has several commodity subsidy programs that we can point our finger at and say that we are also protected and subsidized. In most cases however the average producer is reasonably aided by the federal government while a few large operations appear to be highly subsidized. The payments that these large farms receive are restricted by the \$50,000 per farm limitation of payments. In reality the larger dollar amounts are loans to farms on their crops which are generally paid off by the farmer when the crop is sold into the market. Disaster payments and Federal Crop Insurance payments may distort this picture of all federal farm programs in the public's eye when they are reported in the press. An example of this are the abuses of the federal crop insurance and disaster programs by a few farmers with justifiable criticism by the press and the resulting negative spill over against all farm program payments and producers. Hopefully the recently enacted '94 Disaster and Federal Crop Insurance legislation will begin to put an end to these abuses. Many farmers have been genuinely helped by both disaster payments and federal crop insurance.

Most farmers & ranchers want to be conservationists and yes, even environmentalists. A few bad actors give the vast majority of farmers and ranchers bad reputations. The press and some environmental reports seem to focus on the worst examples, because they are flagrant examples, but which are not representative of the actions of 90 % of the farmers and ranchers.

to compound their problems farmers are caught in a cost/price squeeze of high cost of inputs purchased to relatively low prices for commodities sold. They have survived because of increased technology and farmers ingenuity. Prices for most commodities sold at the farm gate have stayed relatively stable for the past 20 - 30 years, but many inputs especially machinery, repair parts and labor have gone up dramatically. As an example a modern combine 20 years ago (with a cab) cost \$17,000. Today it would be Today \$100,000 plus. Farm labor in the 1950's was \$.50 per hour and today is over \$8-10 /hr. In addition, farmers and ranchers are unable to depreciate their primary productive fixed assets (the land).

The basis for current relatively positive farm economy is increased production per acre brought about by farmers ability to use tools and skills acquired over the past several decades, ie: Improved genetics, larger machinery, improved & efficient methods of pest control, ability to store, process and transport large amounts of raw and finished ag products. U.S farmers are among the most cost effective agricultural producers in the world due to the above mentioned factors as well as the intelligent, innovative hard working farmers and ranchers themselves.

The current situation is that U.S agriculture is over regulated, with a continuing push for more regulation from the federal and state government levels. Much of this regulation is advocated by well intentioned members of environmental groups. There is also too much dependence in row crop agriculture by farmers who look for federal government guidance on which crops and how much to plant as well (as in some cases) how to price or sell their commodities. Thankfully the production of livestock, poultry, nursery crops, fruits and vegetables (except for the disaster programs) is relatively free of direct government support price programs. Lest we forget, remember that roughly fifty percent of agricultural production in this country is generated without government price supports of any kind.

All this must be done with care and conservation of our God given natural resources - soil, water, air and the people involved in commodity production from farm and ranches. The key word is balance; balance between controlled and careful use of inputs and environmental concerns. For environmental and economic reasons most farmers are learning to farm with well placed and lesser amounts of safer pesticides and fertilizers.

Farm and ranch families also produce basic work ethic and moral values. Remember that close to 2 million farm families (many part time) still instill these values in the United States citizenry. If this life style is not so desirable, why do close to an increasing number of people remain as part time farmers & ranchers?

As my friend Bill Helming stated in his December 17, 1994 newsletter; "The average American wants less socialism and liberalism and wants to put the focus on self-reliance, more capitalism and entrepreneurship, and on restoring basic human values, morality and integrity of the individual, the family and our nation". Farmers and ranchers want nothing more than to be "average Americans".

POSSIBLE ANSWERS:

** Some would say "eliminate all federal crop subsidy programs with one stroke of the President's pen. If some farmers go broke in the process, **some one will always farm the land**". **I don't agree!** Number one, we're dealing with people who are producers of food and fiber and who generate 20% of our nation's DNP. Let's use a gradual transition away from direct price supports with some type of safety net for price and production disasters. Secondly there are many acres that would not be farmed if crop and livestock prices dropped below reasonable economic levels. Considerable acres are not farmed today when wheat gets to \$3/bushel and soybeans drop below \$5/bushel. Price is an economic

factor in the production of crops and livestock. Past government programs have contributed to a stable and low cost food supply.

** Farmers and ranchers should further develop their knowledge and skills in the competitive market place and give more attention to money management. Some (farmers & and ranchers) are doing a good job of marketing with the use of forward contracts, hedging and commodity options.

** We need less regulation and more flexibility in federal farm programs. Let market prices dictate which (and how many) crops to plant or livestock, poultry, or aquatic critters to produce. Let's have less interference in the market place for row crops by government subsidies and/or sale of stored government stocks, while providing some type of safety net against extremely low commodity prices.

** Let's have less federal and state interference in the production and movement of agricultural products. Let's have less governmental control in the form of direct regulation of farm & ranch land and the production that takes place on this land. The Endangered Species Act and Swampbuster are forms of direct government interference in production of agricultural products and adversely affect the value of the land as well as the value of production from that land. A classic example of environmental interference is the Corps of Engineers proposal to allow the levels of the lower Missouri river to be mandated for fish and wildlife enhancement and not barge traffic. This proposal will decrease market opportunities for all farmers who depend on the Missouri River to transport their grain down river and fertilizer & fuel up stream. In this case government interference will narrow farmer's already slim profit margin by increasing input costs and decreasing prices paid for grains at the farm gate.

Attempts in Western U.S. to take away water rights owned and/or controlled by farmers and ranchers also add to this economic pressure from the federal government. Or how about the federal proposal to have a restrictive easement on a wide corridor up and down the Mississippi River (highly productive farm land) which will effectively dictate what and how crops and livestock may be managed by regulation by the federal government.

** The United States Trade Representative (USTR) and the U.S. State Department must use the safe guards built into GATT and NAFTA to prevent unfair dumping of agricultural products from other countries, especially where price or excess supply is supported or encouraged by their respective governments. Let's quickly support and enforce these sections of the GATT and the NAFTA.

In conclusion let's "Set the captives free". Free from the 1930's model federal price support programs and free from overzealous federal and state agencies encouraged by activist groups and their well intentioned but not always totally informed membership. Let's have more voluntary and educational efforts like The National Wetlands Conservation Alliance which encourages the protection of wetlands on private land or promote the use of "agro-forestry" and other economic, environmental approaches. Farmers and ranchers are conservationists and yes, even environmentalists. Let's work with volunteer and economic efforts to enhance environmental and financial conditions on the private land in our country.

Let's begin to phase the federal government out of the direct control (financial and regulatory) of agricultural product supply and demand. Family farms (large & small, corporate and sole proprietors) are needed for the continued production of food and fiber and as a well spring of basic moral, ethical, and work values in our great country.

AGRICULTURAL POLICY FROM AN AGRIBUSINESS PERSPECTIVE

Carol L. Brookins
Chairman and CEO
World Perspectives, Incorporated

The theme of this panel "Agriculture in an Uncertain Policy Environment" is an appropriate theme every year, but never before has it been quite as true as today.

We have long tended to look at our own exercise in writing legislation and regulations affecting U.S. agricultural production from an internal domestic economic--and political--perspective. We no longer can afford to take that approach if we want to be winning competitors in today's dramatically changed marketplace.

Our policy must respond to the three dynamic trends driving agribusiness competition:

- Globalization of world markets due to technology and political change;
- Privatization or De-Monopolization of economies; and
- Liberalization of the trading system.

Farmers are not separate from, but they are themselves an integral part of global agribusiness and everyone engaged in U.S. agribusiness today, no matter the location of operations or sales, is operating as a player in the global marketplace. Everyone is competing on a global scale--either directly or indirectly.

And when I use the word global, I am referring not only to geography, but also to the wide range of new, non-traditional products and industries that are growing here in the U.S.

What does this mean in terms of agricultural policy?

It means that if we want to capture an expanding, competitive position in overseas markets for bulk, value-added and consumer ready food products, we will have to be competitive.

It means that if we want to sell traditional crops as a feedstock to non-food and feed processors, or produce non-traditional crops for non-traditional industries, we will have to be competitive.

It means that we need to recognize that production policies can either improve or undermine the competitive position of the U.S. food processing industry, which today has a bigger productivity lead over Germany and Japan than any other U.S. manufacturing industry.

It means that not only policies directly tied to USDA-administered programs, but also every other policy of the government will have to contribute to making U.S. agribusiness competitive. This includes general policies such as tax, fiscal/budget, environmental, regulatory, transportation, and trade.

But I would like to focus in my brief remarks on agricultural policy, because what we do, or don't do, can make or break our competitiveness in all aspects of agribusiness.

First, U.S. agricultural policy is a myth, not a reality. We will not legislate agricultural policy in the upcoming 1995 farm bill; we will legislate commodity programs--just as we have in every past farm bill dating back to the 1949 Agricultural Adjustment Act (AAA).

The farm bill of course has provisions affecting the entire farm sector or agricultural production base, but the key policies and budget entitlements affecting agricultural production, price and marketing are specific commodity programs. No two commodity programs are exactly alike and any farmer who grows more than one crop, or manages both crops and livestock is dealing with a bureaucratic maze of crop program specific regulations that change every year--and sometimes several times during the year.

Second, the original intent of farm programs was long ago forgotten, abandoned or sacrificed to whatever has been the immediate emergency or crisis of the day over the past 60 years.

The so-called farm bill which we write every five years has grown from less than 150 pages in 1981 to more than 700 pages in 1990. It is filled with everything from the pricing of milk to measuring methane emissions from trees. And these monstrous legislative mandates that make up current farm legislation are only amendments to the 1949 Agricultural Adjustment Act (otherwise known as "permanent

legislation"). The AAA provisions were taken from a 1933 Depression-era effort to make a short-term income transfer to rural residents.

For accounting reasons, that income transfer was made through per unit price payments/supports and it remains the very core or basis of U.S. commodity policy today.

Third, we have learned that trying to guarantee a per unit price, based upon a calculated mythical national average cost of production, has led to a lot of convoluted production policies that keep agricultural economists busy, farmers confused, and consultants rich.

For more than half a century the budget impact of this per unit price guarantee policy has led to supply management schemes like land banks, set asides, PIKs and ARPs. It has meant that farmers prospered and expanded outside of the U.S. at the expense of our own competitive position, and many times it has kept U.S. farmers from producing crops in demand around the world.

Agriculture must get out of the policy "twilight zone" of 1933 in order to benefit from the unprecedented opportunities of the 21st century's global markets.

Agricultural policy needs to be based on an understanding that farming is a business, it is agribusiness. And, just as the profitability of any business is measured by the return on investment (ROI), so is farming. Price per unit is only one component in the formula of ROI. The full ROI formula is price times volume minus cost.

A step in this direction would be to provide as much flexibility in commodity production decisions as possible. The "new" or old, if you remember the 1970s, concept of a whole farm base or normal crop acreage "NCA" would be a good move. With budget costs reducing the amount of base eligible for deficiency payments, farmers will be additionally encouraged to determine what markets hold the greatest return. They will increasingly manage their risks through market operations.

But, this is, I believe, only a temporary or transitional measure. When we write the 1995 farm bill, I hope we agree that agricultural policy needs to undergo a fundamental change, and that the law includes a mandate calling for the termination of "permanent legislation" in the year 2000.

A possible approach would be to establish a commission--like the Pepper Commission on Social Security Reform. The two-year mandate of the Commission would be to:

- Determine what, if any, role the federal government should play in providing support to the farm sector;
- Develop alternative approaches to providing a financial safety net to production agriculture;
- Authorize pilot programs to be tested in the three years leading up to Farm Bill 2000.

One approach I recommend could be to develop a quasi-public corporation that would operate similar to the way the FDIC provides for risk management in the banking industry. The federal government could provide some coverage of insurance premiums as a safety net for gross farm receipts.

There have been other proposals, like revenue assurance and tax code revisions, such as income averaging or farmer-IRAs, and futures market hedging.

Whatever policy or policies that emerge to carry U.S. agriculture into the 21st century must build on and support the underlying comparative advantage of our food and fiber system.

We have been living with blinders on by viewing agricultural policy as commodity price supports. What is needed today is a new way of approaching support to the sector. We should be giving support to export financing and marketing, to commercially relevant research, to technologically-driven innovation. Agricultural policies should seek to support sound producer risk management, to reduce costs and disruption to production, and to maximize return on investment from the marketplace. Agricultural policies should support diversified agribusiness expansion through maximizing purchasing, processing and marketing efficiencies.

In sum, it is time to begin a serious effort to move forward into the future instead of holding onto the past, and build a policy structure that allows American agribusiness to flourish--from farm to markets.

Remarks by Congressman Pat Roberts
First District, Kansas
Chairman of House Agriculture Committee
USDA Outlook Forum
February 22, 1995

Thank you for your kind invitation. This is the first opportunity I have had officially visit with anyone with the USDA since being selected Chairman of the House Agriculture Committee.

As a matter of fact, we Republicans feel like the turtle who stuck his head out of his shell and discovered he was sitting on a fence post -- he didn't know how he got there or what he was going to do but he knew he must have had a lot of help and he was the center of attention. That helps brings me to a point of business.

We all know the high road of humility is not bothered by heavy traffic in Washington.....but it is a privilege to be here with you today.

First, in serving with former Senator Frank Carlson of Kansas, my predecessor Keith Sebelius and as a Member of Congress, we have been riding shotgun for and with the Department of Agriculture for almost 30 years. And, it has been quite a ride. Senator Carlson, the man who founded the White House and Congressional Prayer Breakfasts, was fond of saying there are no self made men or women in public office, that it is your friends who make you what you are. With that in mind, to all of my long time friends in the USDA, thank you. We've won some and lost some but the important thing is that with some notable exceptions, we've been riding in the same posse and in the same direction.

Goodness knows, how many annual meetings I have attended in our 66-county, "Big First" District. One of the questions I inevitably get is:

"Pat, do you really think we will ever get the line-item veto and a balanced budget?"

And, I always respond by saying the farmer would never plant the seed in the ground if he wasn't an eternal optimist and that I hoped I eventually lived to see the day where we would balance the budget, Republicans would take over the Congress and Kansas State would have a winning football team. You know, I don't even know what to ask for anymore!

There are not many times when there is a true crossroads opportunity in public policy and today we have an historic opportunity. As we work together to achieve our mutual goals, I have a suggested theme. Our theme for agriculture in 1995 may be best summed up with a song written by Johnny Mercer for Bing Crosby some 50 years ago -- "Accentuate the Positive, Eliminate the Negative, and Don't Mess With Mr. In-Between!"

Well, what do I mean about accentuating the positive? If you listen to the

business as usual crowd in Washington and some in the national news media, you would think the world ended on November 8. But, if you believe that government should be smaller, less intrusive, spend less money, live within its means and once again be a partner with citizens instead of an adversary, the change taking place in Washington represents a long overdue revolution.

But, we will also bear part of the responsibility of achieving a balanced budget and that will involve additional sacrifice. However, it will be good for America and our children and their children. And, that about sums it up.

I know. I know. I understand your sense of frustration. I share it. Everyone in this audience and throughout farm country knows farmers and ranchers have already sacrificed in the effort to control spending. For all of the self declared and instant Secretaries of Agriculture in the Congress and all of the agriculture "know nothings" in Washington, let us once again set the record straight.

From 1981 to the present, we have reduced authorized levels of farm spending by over \$50 billion. Then, in 1983, we froze target prices and in 1985, we reduced them. And, in 1990, we cut farm program spending by another 20 percent and cut the farm payment acres by 15 percent through the adoption of triple base. ONLY FARM PROGRAMS HAVE DECLINED SINCE 1985 ON AVERAGE OF 9 PERCENT A YEAR AND ONLY FARM PROGRAMS ARE EXPECTED TO DECLINE EVERY YEAR IN THE FUTURE.

Now, our critics have not or will not fathom the difference between a so-called "subsidy" and a "deficiency payment", but they at least should understand that if all other Federal programs over this period had received comparable reductions our deficit problems would be manageable. Yet, when we talk about the need for additional spending cuts, the perception in Washington is that agriculture should be on the chopping block; not with fingers but with arms and legs.

It is a paradox of enormous irony. I don't know of any farmer or rancher who is not for the line-item veto or the balanced budget amendment. I don't know of many farmers who have not wished and prayed for the day they could receive a fair return from the marketplace as opposed to deficiency payments. I don't know of any farmer or rancher who is not fed up with government farm programs in terms of regulatory overkill and all of the red tape, regulations and damn fool -- cost burdens that are unnecessary and counter-productive.

So here we have the men and women of agriculture who volunteered and served in the front lines of the budget battle and who are willing to continue that effort within the spending reduction trenches. Yet, they are being tagged and lectured by well fed, armchaired, behind-the-lines generals who allege that somehow the aggies have been dodging the budget draft. To those who complain about agriculture with their mouths full, we gave at the office and we will continue to meet our budget responsibilities, thank you. We'll make do with less, we always have. Just make sure all of those other

spending cows are on the same chopping block.

As Chairman of the House Agriculture Committee, I promise three things:

First, I will do everything in my power to make sure that agriculture is not singled out for an unfair disproportionate share of the cuts and that the cuts will be across the board.

In fact, the first hearing of the House Agriculture Committee did not focus on farm programs. In concert with the Contract with America, we are looking at the best way food stamps and nutrition programs can fit into welfare reform. With food stamps and other nutrition programs accounting for over half of agriculture's \$62 billion budget it is time we eliminated the waste, fraud and abuse. That figure runs over \$2 billion.

Second, I will do everything within my power to make sure that the cuts and the money that farmers contribute to the effort to balance the budget will go to deficit reduction and not to other programs, as it has in the past.

Third, in exchange for spending cuts, I will do everything within my power to make sure we stop the tidal wave of environmental mandates that are void of any real-world cost-benefit analysis. And, as we transition into a true market oriented agriculture we had better make sure that "market oriented" is reflected in real terms with a clear, aggressive export policy.

In the past, there has been a lot of talk about a market oriented farm policy that instead resulted in market interference and using the farmer as a public utility in behalf of foreign policy, environmental objectives, and to control food costs. You can't have it both ways. This time we talk the talk and walk the walk--no Mr. In-between.

Now, let's really accentuate the positive. We have stated the obvious, that the 1995 farm bill will be dictated by the budget debate and this will translate into less payment dollars to farmers. But, that was a fact no matter who ran the Congress. Now, with a conservative majority, let's look at the "other side of the story" and that gets pretty darn exciting.

--We will see major reform of private property rights. It is time the Federal government quit taking your property without compensation.

--It is time we protected wetlands of true importance to the environment, not some low spot in a field where no self respecting duck would ever land. We will define what a wetland is and which agency is responsible.

--It is time to give farmers a break on capital gains. You work hard all of your lives to acquire the assets necessary to build a farm but if you try to sell that farm to your son or daughter, you are forced to pay a capital gains tax that destroys your retirement. That is a crime against every hard working farmer especially when most of the gain is due to inflation. We are going to change that.

--Just as important, if a farmer decides to avoid the capital gains tax and works until he dies, the Federal government steps in and assesses an estate tax out of touch with economic reality that punishes the farmer for dying! We are going to change that.

--In 1986, we passed so called tax reform and the farmer lost income averaging. Say the Good Lord is willing, it rains and the creeks don't rise and you have a bountiful harvest. The tax on that should take into account the year before when a drought or flood wiped out the crop.

--The same goes for writing off at least 25% of your health insurance premiums with the goal of 100% given our budget responsibilities. We will restore that and increase it.

--Every time we turn around, the city council, county commission, school board, bank, business, or cooperative increases our taxes or the cost of doing business due to a never ending laundry list of unfunded mandates. Dealing with this crucial and fundamental problem will be the first order of business in the Senate and the second order of business in the House.

--My predecessor, a country lawyer, used to joke, "When in doubt, sue!" Its no joke today. When a farmer buys a farm, the first thing the banker tells you is to buy liability insurance just in case. It is time we reformed our legal system and that too is on the agenda.

You can tell which way the posse is riding. Private property rights, unfunded mandates, estate tax relief, capital gains tax relief, a balanced budget, line-item veto, regulatory relief, scientific assessment of risk, cost benefit yardsticks, legal reform, welfare reform -- all parts of the Contract With America.

If we fail, the social welfare state will be back, stronger than ever. If we win, America will be a better place for us and our grandchildren. Lets accentuate the positive. Lets win.

Finally, let me turn to the 1995 Farm Bill. I doubt if we will see hearings on the Farm Bill on the House side until April following action on the Contract With America.

We, on the House side will hold our hearings in Washington--and in farm country. We want the advice, counsel and suggestions of farmers and ranchers. We are going to try to emphasize what agriculture has done right and build from that.

Meanwhile, the new Chairman of the Senate Agriculture Committee, Richard Lugar of Indiana, has or will soon begin hearings and has already stirred up quite a bit of dust.

Taking this crossroads policy opportunity to heart, he has stated flat out, he is stepping back from the current farm programs trees and is intent on clear-cutting.

The Senator has asked all farm organizations and commodity groups to answer 53 questions no less--starting with, "Do we really need a farm program?" and suggesting we take program payments and send them back to the states in the form of rural development block grants.

Personally, I believe this proposal merits study in the form of a pilot program--in the State of Indiana...

Seriously, given the fact we are at a policy crossroads in a post NAFTA-GATT

global market and given our budget responsibilities Senator Lugar is doing us a favor. If we cannot answer the questions, we should not be in the business of defending what cannot be justified, or business as usual.

If you are sinners in the hands of our angry critics in February--don't worry, you can be born again in the spring in our tent!

However, there will be fundamental change in the farm program...

We need a thorough debate on whether we allow more planting flexibility. NAFTA and GATT will require a farm policy that allows farmers to respond to market opportunities. It makes little sense for Federal farm policy to force farmers to plant crops that are not needed in the export market.

We are not only debating a farm bill but the rationale as to why we even have one. Historically, our rationale has been supply management. But, requiring farmers to set-aside land as the ticket to farm program participation seems to make little sense when the more we set aside, the more our competitors increase plantings and steal our markets.

Even if set asides are discontinued, we will have at least 25 million acres tied up in the Conservation Reserve Program. The CRP program will be continued but we will have a healthy debate on which land should be enrolled, the payment rate and ultimately, how many acres will be in the reserve.

Our current Export Enhancement Program focuses on bulk commodities. We will try to determine how much more focus should be on the value-added exports. Value-added means jobs and beef and pork should be big winners under NAFTA and GATT.

Programs that rely on quotas, import restrictions and unrealistically high support rates are facing a unique transition opportunity. That's the nice way of saying they will be under attack by long time critics. We will implement these reforms in cooperation with the commodity associations involved or others will do the job for us as happened with honey and the wool and mohair programs.

We must improve our productivity through research in such areas as biotechnology and demonstrate to the world that it certainly makes more sense for a farmer in the United States to farm in an environmentally sound manner than it is for a peasant farmer in China to farm a side hill or a Brazilian farmer to slash and burn the Amazon rain forest.

We do, in fact, have an historic opportunity.

We have more prime cropland per capita than any other nation except Argentina. We have better weather. We have the best technically trained farm managers and entrepreneurs. We have the best infrastructure, research and a huge lead in biotechnology. We have the most efficient food processing industry in the world.

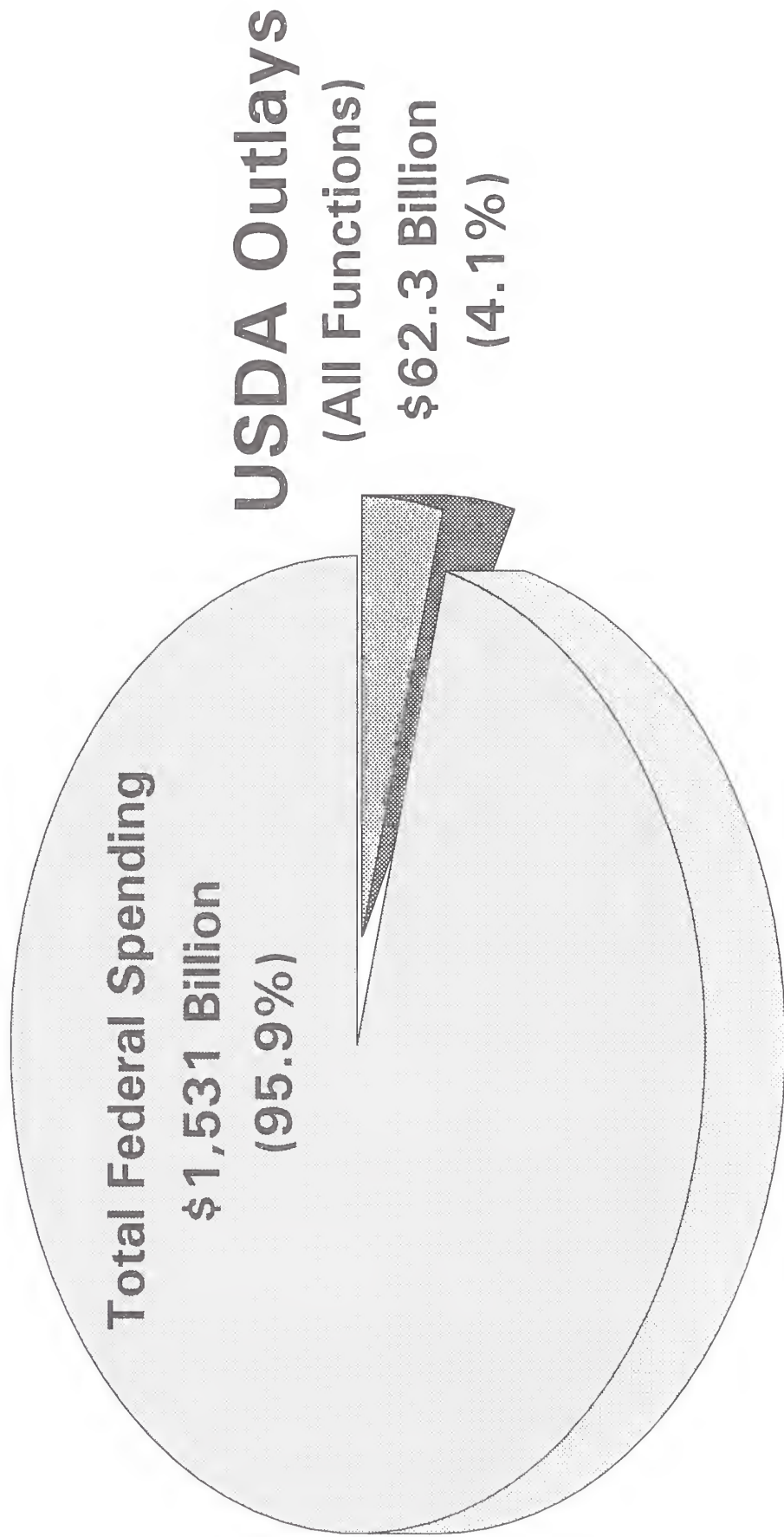
My friends, we are truly at a crossroads. I believe we can write a farm bill that is fair to the taxpayer, the consumer and the farmer. We can, with NAFTA AND

GATT and with a clear and aggressive export policy, compete in the global marketplace and win back market share. We can restore farm income as a priority goal. We can meet our environmental responsibilities. We can stop the tidal wave of unfunded mandates and regulations.

We need the USDA in this pride and profit posse for agriculture. And the time is now. Let us accentuate the positive and eliminate the negative. Again, thank you for the privilege and let's go to work.

USDA Outlays in the Federal Budget

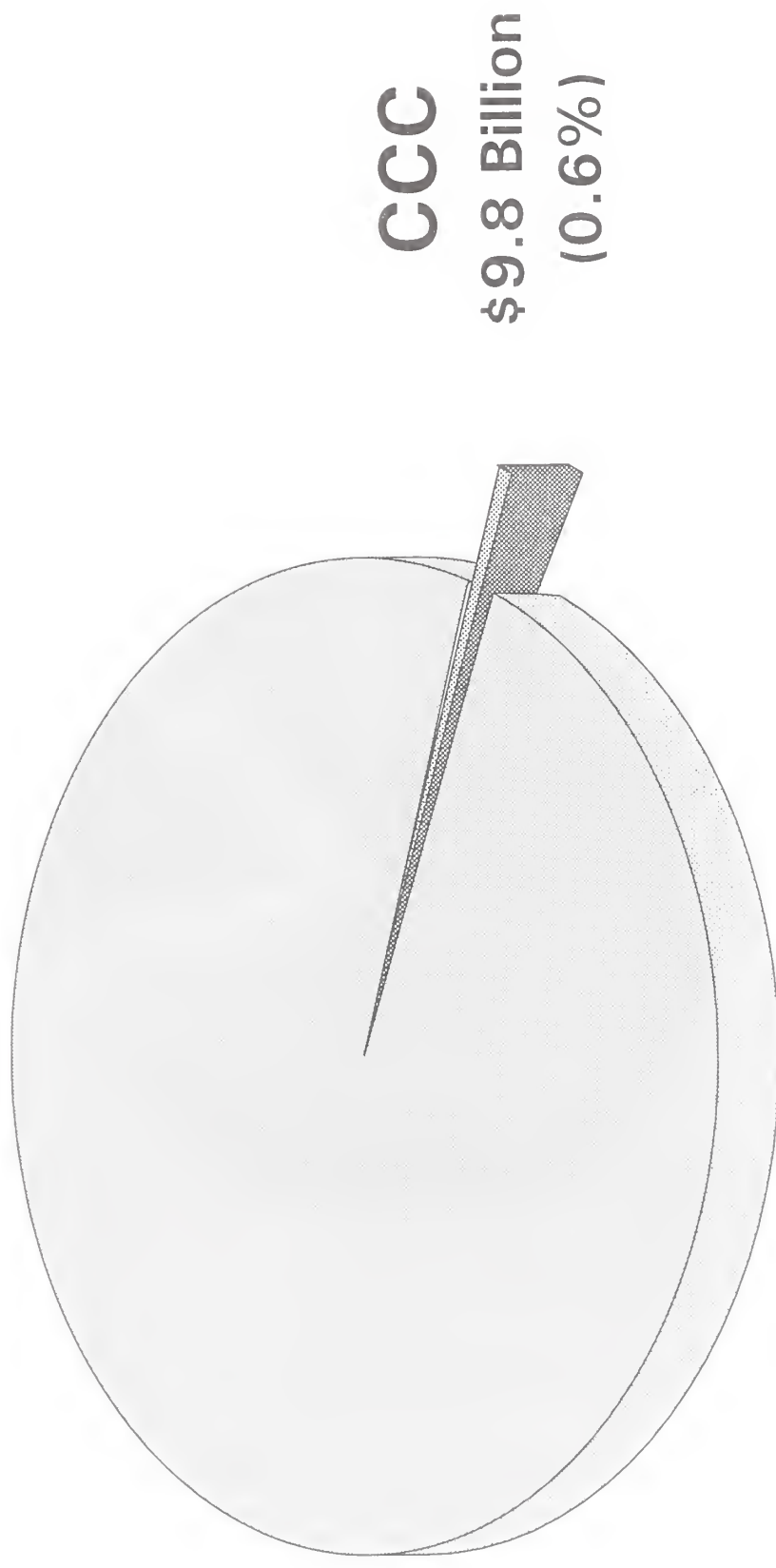
Fiscal Year 1995 (Estimate)



Source: CBO, USDA

Farm Price Support Outlays in the Federal Budget

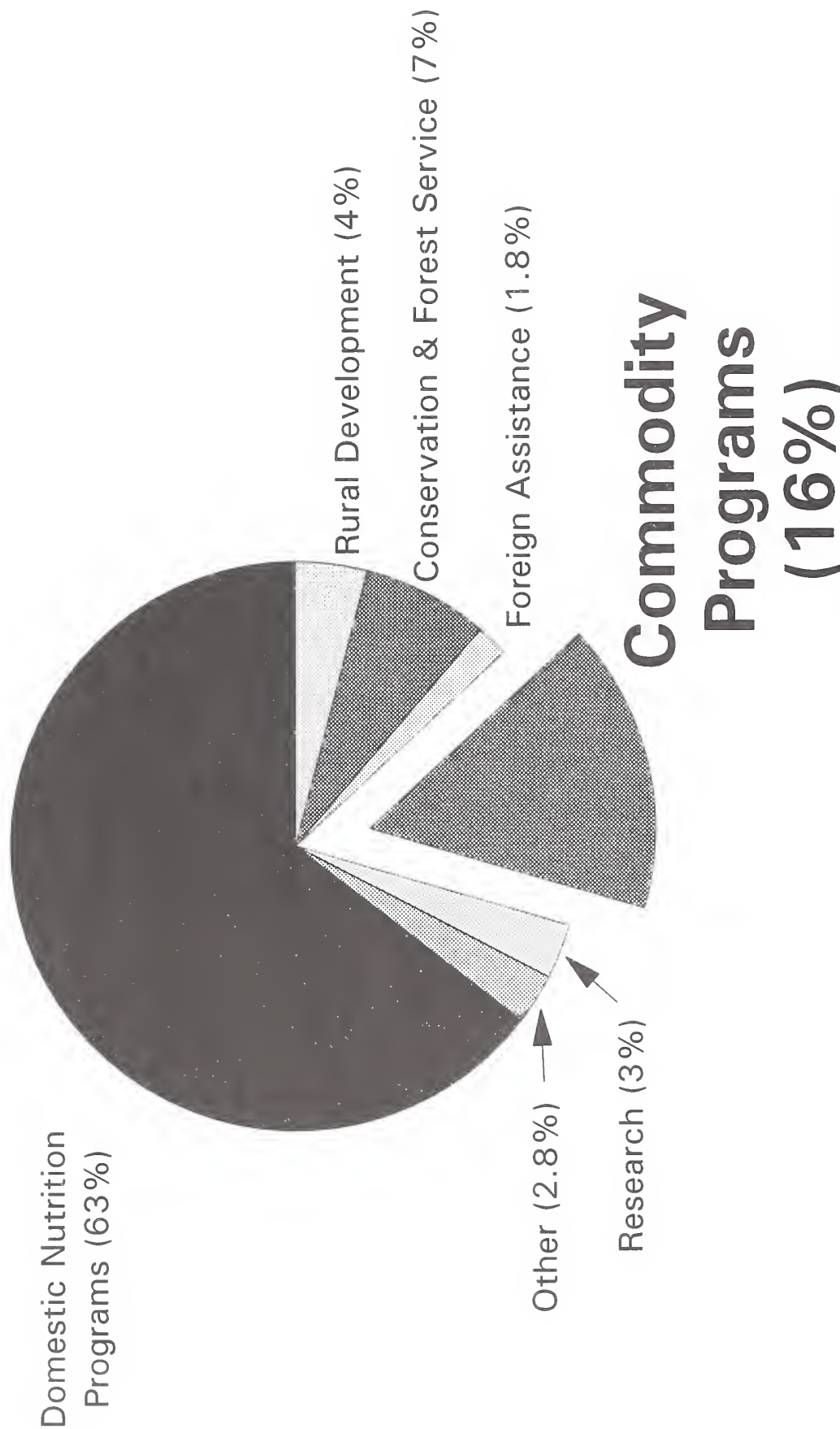
Fiscal Year 1995 (Estimate)



Source: CBO, USDA.

USDA FY 1995 Outlays by Program

(Estimated)



The Agriculture Policy Ledger

Debits (-)

Required Changes

Less Federal Dollars

Reform Quota Programs

Credits (+)

Needed Changes

Private Property Protection

Cost/Benefit Applied to
Regulations

Reform Wetlands
Regulations

Capital Gains Tax Cut

Health Care Deduction

Eliminate Unfunded
Mandates

Reform Endangered Species
Act

Use Sound Science in Risk
Assessment

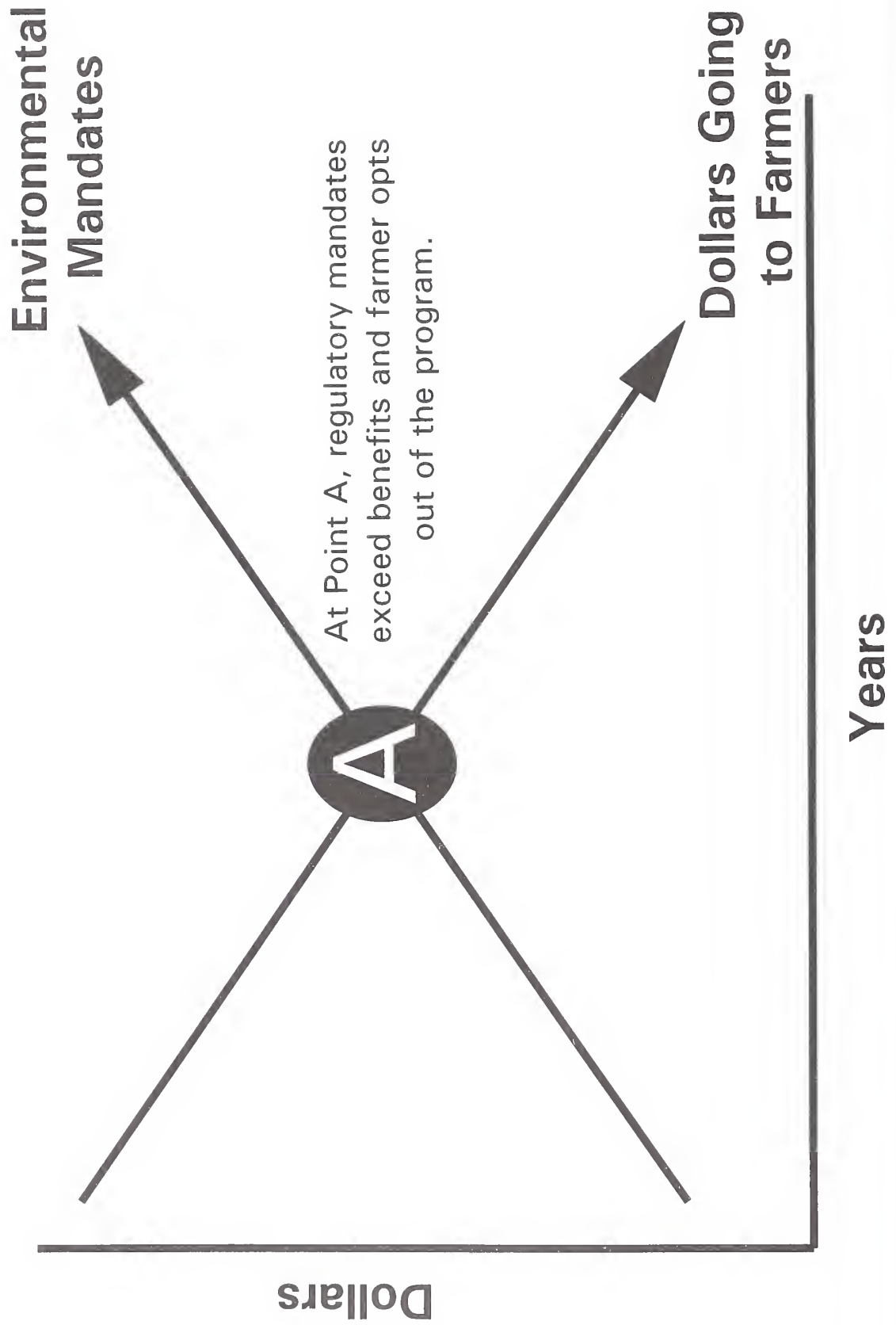
Reform Coastal Zone
Management Act

Planting Flexibility

Elimination of Set Asides

Continuation of CRP

Conservation Compliance and Farm Program Participation



USDA's INTERNATIONAL GRAINS AND OILSEEDS PROJECTIONS

Ron Trostle
Chief, Trade Analysis Branch; USDA/ERS/CAD

My assignment is to present a set of 10-year projections for the world's supply and demand for grain and soybeans, and the implications that the global picture has for U.S. trade. This baseline scenario is not a forecast for the future. Instead, it is a conditional, longrun scenario about what would be expected to happen under a specific set of assumptions.

My presentation will be a brief summary of USDA's Long-term Agricultural Baseline Projections report, which contains much more detail about the assumptions, and the projections for individual commodities and countries.

Assumptions

The USDA baseline scenario makes many assumptions about the United States and other countries. Changes in any of the assumptions can significantly alter the projections, and actual conditions that emerge will alter the outcomes. Some of the more important assumptions include:

General Assumptions

There are no year-to-year supply shocks due to abnormal weather.

The world population growth rate continues to gradually decline from about 1.67 percent currently, to 1.5 percent by 2005. However, the global population continues to increase by more than 95 million people each year.

Per capita income growth (adjusted for inflation), in most countries, converges on or slightly below long-term historical growth rates. Growth rates pick up slightly after 2000 in response to the full cumulative impact of trade liberalization arising from the Uruguay Round Agreement.

Policy Assumptions for Major Countries

It is assumed that countries abide by their GATT commitments. Export subsidies and volumes agreed to under the GATT agreement will be used to the maximum extent by both the United States and the European Union (EU).

For the United States, it is assumed that the agricultural and trade policies that existed in December of 1994 continue. Subsidized wheat exports decline from 20.2 million metric tons (MMT) in 1995, to 14.5 in 2000 and thereafter. Funding for credit guarantee and food aid programs are assumed to remain at about current levels. CRP acreage reaches 38 million acres in 1995; then declines to about 32 million by 2005. ARPs are zero for nearly all crops in all years, except for cotton. (See USDA's Baseline Projections report for more details.)

China's political situation is assumed to remain relatively stable over the period. Market reforms continue, but the central government remains strong. Real GDP growth slows from its current high levels, but remains robust compared to growth in the rest of the world. Savings and investment expand in the stable environment. Income growth promotes demand for all commodities. The protein content in feed rations rises.

The European Union assumptions presume no further EU enlargement beyond the EU-12. CAP reform reduced grain support prices, but continued yield growth pushes EU grain production up despite area set-aside requirements. Supplies will be large enough, and world prices high enough, that the EU will be able to export some wheat without subsidies after the year 2000. Oilseed area will be limited by provisions of the U.S.-EU Oilseed Agreement, reducing production from the high levels of the early 1990s.

For Mexico, NAFTA eliminates its nontariff agricultural trade barriers, opening it to foreign investment, accelerating consumer expenditures, and boosting economic growth. PROCAMPO moves Mexico's agricultural support prices down toward world market prices; corn production drops, but output of other commodities expands. Income growth stimulates both domestic livestock production and meat imports at a rate faster than output rises for corn, sorghum, soybeans, and soybean meal.

The former Soviet Union (FSU) policies focusing on market reform are assumed to continue, but the transition to a market economy will occur slowly. Through 1996, GDP growth continues negative and per capita incomes fall; thereafter, economic growth occurs slowly. Food, feed, and industrial use stay relatively depressed. The protein content of mixed feed increases slightly. Reflecting poor income growth, FSU food and fiber imports continue declining for several years, then slowly begin to recover. However, imports remain well below those of previous years. Grain imports from non-FSU countries decline sharply as import demand slows and intra-FSU grain exports expand.

A reduction in Canada's transportation subsidies offered through the Western Grains Transportation Act is assumed to be offset by government support that is GATT-legal. The baseline assumes that U.S. grain imports from Canada will not be restricted.

Global Overview

Now, let's see how the assumptions are translated into impacts on the world grain and soybean markets.

Rising demand is expected to generate increased global trade for the major agricultural commodities during the 1996-2005 projection period. The rate of growth of world trade of wheat, rice, coarse grains, and soybeans is expected to be faster than during the last decade, and to accelerate after 2000, in part due to strengthening incomes from GATT.

Total world use of grains trends upward about 1.5 percent a year, about equal to projected population growth. Demand by middle-income countries rises most rapidly as their consumers improve both the quantity and quality of consumption. Growth in feed use of grain, which has been lagging food use in recent years, picks up and once again equals the growth rate for food use. Total per capita use of grain, which has declined since its 1986 peak, levels off early in the baseline line period.

Crop yields are projected to rise more slowly than long-term historical growth rates. Although some of the land that was withdrawn from grain production in the 1980s is expected to return to grain, less land is devoted to grain production than in the early 1980s.

World grain trade is projected to climb 2.5 percent a year, after experiencing a declining trend during the 1980s and early 1990s. However, the renewed growth is below the robust growth of the 1970s.

Growth rates for U.S. exports of wheat, coarse grains, and soybeans are projected to recover from declines in the last decade but still fall short of the rapid growth rates of the 1970s. U.S. soybean meal exports show little growth through 2000, but then accelerate. U.S. rice exports fall throughout the baseline period because of strong domestic use and limited capability to increase production.

Relatively tight global supply and demand balances, cause U.S. prices (and prices in other market oriented countries) to rise during the coming decade, after falling in the 1980s. However, prices do not rise as fast as in the 1970s, and after adjusting for inflation, they trend downwards (see table).

Total Grains: Indicators of global change

Item	Annual growth rates ¹				
	1960-70	1970-80	1980-90	1990-95	1996-2005
			Percent		
Population	2.04	1.83	1.73	1.71	1.52
Total World Grains:					
Area	0.54	0.90	-0.56	-0.31	0.29
Yield	2.7	1.9	2.1	0.6	1.2
Production	3.2	2.8	1.6	0.3	1.5
Total use	3.2	2.6	1.7	0.8	1.5
Per capita	1.2	0.8	0	-1.0	-0.1
Feed use	4.5	2.4	1.7	0.3	1.5
Exports ²	3.0	6.3	-0.7	-0.7	2.5
Ending stocks	1.4	5.8	1.2	-3.2	-0.2
Prices: ³					
Wheat:					
Nominal	-0.8	9.0	-4.9	4.1	2.5
Real	-3.8	1.8	-9.0	1.5	-1.5
Corn:					
Nominal	1.3	7.2	-3.0	-0.2	1.9
Real	-1.7	-0.1	-7.2	-2.8	-2.1
Rice:					
Nominal	0.5	5.1	-5.1	0.2	3.5
Real	-2.5	-2.1	-9.2	-2.5	-0.6
Soybeans:					
Nominal	1.6	8.3	-1.4	-0.3	2.0
Real	-1.4	1.1	-5.6	-2.9	-2.0

¹ Growth rate of exponential trend for 11-year period including beginning and end of decade.

² Export growth rates exclude intra-EU and intra-FSU trade.

³ U.S. season average farm prices. Real prices deflated by US GDP deflator.

Wheat Trade

Between 1996 and 2005, world wheat trade (including the wheat equivalent of wheat flour) is projected to grow 24 million metric tons (MMT). The 2.5 percent average annual growth rate is well above that of the 1980s. Most import growth will occur in higher-income developing countries and China.

Under GATT, subsidized exports are expected to fall from about 40 percent of world trade in 1994 to about 25 percent by 2000. Many of the least developed countries will face significantly higher wheat prices when subsidies are reduced. Their imports will be further constrained because the value of credit and food aid is not assumed to increase in the baseline. Thus, wheat imports by the least developed countries will grow somewhat slower than in the higher income developing countries.

The country forecasts generally show slower growth in wheat production as the growth rate in yields falls below long-term historical rates. However, acreage is expected to expand at a slow rate, reversing the trend of the last decade, when foreign area dropped sharply, particularly in the FSU.

Foreign consumption growth for wheat is smaller than in previous decades, expanding 1.5 percent annually. Per capita feed use continues to fall, particularly in the FSU and Eastern Europe. Per capita food use of wheat rises as growing consumption in the high income developing countries and China offsets declines in the poorest nations, particularly in Africa.

U.S. wheat exports in the baseline grow at a slower rate than world trade for several reasons. Higher global prices stimulate foreign production. Unlike corn, for which there are few competitors, U.S. wheat exports will face strong competition in markets which are growing the fastest. Increasing prices will bring more U.S. area into production but yield growth will be slow. And, the large amount of wheat acreage in the CRP limits the area response to rising wheat prices.

The U.S. share of world trade in 2000 will about equal the 1990-94 average of 32 percent, but begins to decline after 2000, falling to 31 percent by 2005. Strong gains are expected in other exporting countries, except for the EU. For the EU, GATT restrictions are expected to limit exports and market share through 2000. After 2000, EU market share begins to expand as world prices rise high enough for the EU to export wheat into the world market without subsidies.

Importer Developments for Wheat

China's imports expand significantly by 2005, reaching 17.5 MMT, as production grows more slowly. However, uncertainty about yield improvements, foreign exchange earnings, market liberalization, and self-sufficiency policies means a wide range of possible trade outcomes are possible.

Developing countries account for much of the projected increase in imports. If income growth in the developing countries is less than projected it will constrain their ability to finance imports. This would mean that larger U.S. and other exporter credit and assistance programs would be needed to achieve the projected imports.

The FSU is projected to reduce imports by nearly 13 percent between 1996 and 2005. Slow recovery in the livestock sector will keep feed use of wheat low. Higher prices, more high quality wheat, lower post-harvest losses, and improved internal distribution limit FSU import needs and encourage stronger exports by several FSU countries. Imports will continue to be constrained by limited access to exporter credit. Most of the FSU's import needs will be met by other FSU countries.

Eastern Europe, currently a small net importer, will shift to a significant net exporter by 2000. Production will expand in response to higher world prices, but consumption will remain relatively low.

Exporter Developments for Wheat

The EU dominates competitor developments. Under GATT, the EU's subsidized wheat and flour exports will fall from 19.1 MMT in 1995 to 13.4 MMT (excluding food aid and small amounts of unsubsidized semolina) in 2000. At the same time, yield increases push grain production up despite area set-aside requirements. To avoid building stocks, it is assumed that after 2000, the EU will increase set-aside requirements to restrain production growth. Also, as world prices rise after 2000, the EU will be able to export some wheat without subsidies.

World Wheat Trade

Countries	Average 1992-94	1996	2000	2005	Growth 1996-2005
Million metric tons					
Importers					
China	6.7	10.7	14.6	17.5	6.8
Iran	2.9	3.2	4.2	6.4	3.3
N. Africa & Mid East, nes ¹	6.0	6.7	7.7	8.9	2.2
Indonesia	2.9	3.3	4.0	5.0	1.7
Egypt	5.8	6.1	6.7	7.7	1.6
FSU	16.5	11.8	11.3	10.5	-1.3
Algeria	4.1	4.5	5.0	5.7	1.1
Pakistan	2.4	3.3	3.5	4.4	1.1
Iraq	0.6	1.8	2.2	2.8	1.0
Brazil	5.7	6.1	6.4	7.0	0.9
S.Korea	4.5	2.8	2.5	2.5	-0.3
E.Europe	2.4	1.0	1.0	1.0	0.0
Rest of world	42.6	40.8	43.2	46.9	6.1
Total imports	103.1	102.2	112.3	126.2	24.0
Exporters					
US	34.7	32.6	36.2	39.6	6.9
Canada	20.3	20.5	23.4	25.3	4.8
Argentina	5.8	5.9	7.4	10.1	4.2
Australia	9.6	11.5	14.2	15.7	4.2
E. Europe	0.9	1.5	4.2	5.2	3.7
EU-12	20.0	20.3	16.3	19.2	-1.1
FSU	6.5	7.0	7.4	8.0	1.0
Saudi Arabia	2.0	0.5	0.4	0.2	-0.3
Rest of world	2.8	2.4	2.7	2.9	0.5
Total exports	102.6	102.2	112.3	126.2	24.0
Percent					
US trade share	33.8	31.9	32.2	31.3	--

¹ nes = not elsewhere specified.

Australian and Canadian area, production, and exports rise because wheat prices become more favorable than those for sheep and alternative crops.

Argentina boosts exports by taking advantage of growing markets in Brazil and other Latin American countries.

East European countries also respond to higher world prices and reduced competition from the EU by expanding area and greatly increasing exports.

Rice Trade

Rice trade is projected to trend upwards 2.9 percent per year between 1996 and 2005, when it reaches 19.5 MMT. More rapid growth in medium-grain rice trade is expected under the recently completed GATT, especially for japonica, the medium-grain variety preferred by consumers in Japan, South Korea, and Taiwan. Medium-grain prices are expected to rise relative to long-grain prices due to limited potential japonica production capacity.

The growth in foreign production is projected to slow to 1.5 percent per year, down from 2.4 percent in the 1980s. The lower growth rate reflects slower increases in total area, irrigated area, and yields.

At the same time, the upward trend in foreign consumption also slows to 1.5 percent per year, reflecting slower population growth rates and a decline in per capita consumption. Increases in per capita consumption in India and the Middle East do not offset declines in China, Japan, and the rapidly developing Asian countries.

The U.S. share of world exports declines from 20 percent in 1990 to 12 percent by 2005 as minimal domestic production gains and strong domestic use limit the volume of U.S. rice exports. U.S. exports decline to 2.3 MMT, while imports rise to 0.7 MMT leaving net exports of 1.5 MMT in 2005. As a major exporter of medium-grain rice, the United States could benefit significantly from the GATT as U.S. prices and export values rise, but the full extent of the gain depends on U.S. capacity to expand production and exports on a sustainable basis. Despite significant export gains made in East Asian markets under GATT, particularly in Japan, total U.S. rice exports do not expand in the baseline. A widening export price premium implies that the U.S. will lose some of its long-grain exports in the more "price-sensitive" markets.

Importer Developments for Rice

Minimum access for the high-valued japonica markets of Japan and South Korea grow from an initial 429,000 tons in 1995 to 963,000 tons by 2005, thus challenging the world's ability to supply large volumes of high-quality japonica on a sustained basis. Japan and South Korea have very strict preferences for japonica rice.

Traditional long-grain import growth will be fueled by the needs of the Middle East, Africa, and Brazil. Industrialized countries' imports continue growing at a slow, but steady, pace.

Exporter Developments for Rice

Most japonica producers have limitations on their ability to respond to the GATT minimum access market openings in the japonica consuming countries of Japan and South Korea. Only three viable long-run sources of high-quality japonica currently exist--Australia, China, and the United States, in particular, California.

For Australia and California, constraints on expanding area will limit increases in exportable supplies. As a result, both sources will be forced to shift exports away from existing markets in order to respond to the high prices offered by Japan and South Korea.

China must overcome significant infrastructural deficiencies before it can successfully compete for the sophisticated and exacting rice markets of Japan and South Korea. In fact, China is expected to increase imports of high-quality and aromatic long-grain rice for its own high-income urban consumers.

The revival of Burma's second-crop rice, principally destined for export markets, is projected to generate rapidly expanding exports -- from only 0.2 million tons in 1993 to over 2 million by 2005.

Rice Trade Baseline Projections

Countries	Average 1992-94	1996	2000	2005	Growth 1996-2005
Million metric tons					
Importers					
N. Africa & Mid East, nes ¹	1.0	1.0	1.2	1.6	0.6
Sub-Saharan Africa	2.5	2.4	2.7	3.0	0.6
Iran	0.8	0.9	1.0	1.4	0.5
China	0.4	0.4	0.6	0.8	0.4
United States	0.2	0.3	0.5	0.7	0.4
South America	0.5	0.4	0.5	0.7	0.3
C America/Caribbean	0.7	1.0	1.1	1.2	0.3
Japan	0.9	0.6	0.8	0.8	0.2
Iraq	0.5	0.6	0.7	0.8	0.2
Saudi Arabia	0.8	0.8	0.9	1.0	0.3
Turkey	0.2	0.2	0.3	0.4	0.2
Rest of World	8.6	8.2	6.3	6.2	6.2
Total imports	15.1	15.1	16.8	19.5	4.5
Exporters					
Thailand	4.5	4.5	5.2	5.9	1.4
Burma	0.6	0.9	1.2	2.1	1.3
India	.7	0.6	1.1	1.6	1.0
China	1.2	0.8	1.1	1.7	0.9
United States	2.6	2.6	2.4	2.3	-0.3
Australia	0.6	0.6	0.7	0.8	0.2
Argentina	0.6	0.3	0.4	0.5	0.2
Pakistan	1.1	1.4	1.5	1.7	0.3
Vietnam	2.0	1.9	1.8	1.7	-0.2
Rest of World	1.2	1.6	1.3	1.4	-0.2
Total exports	15.1	15.1	16.8	19.5	4.5
Percent					
U.S. trade share	17.2	17.3	14.2	11.5	--

1/ nes = not elsewhere specified.

In Thailand, falling per capita consumption and trend growth in yields offset declining area and maintain abundant exportable supplies.

India's rice exports double from 0.8 million tons in 1994 to over 1.6 million by 2005. The export share for superior quality, aromatic basmati rice (comprising nearly 50 percent of exports in 1994) declines relative to non-basmati.

In Vietnam, growing consumption generated by rapid population growth and rising incomes overtakes slowing production and erodes exportable supplies. Limited increases in arable land combined with already high levels of input use prevent rice production from maintaining the same pace achieved from 1989 to 1992.

Coarse Grains Trade

Reversing a downward trend in the last decade, world import demand for coarse grains is projected to strengthen through 2005, with annual growth rates exceeding 2.7 percent. Global coarse grain trade is projected to grow to near 114 MMT by the year 2005, 5 percent above the record trade of 107.9 MMT reached in 1980/81.

A key assumption underpinning the export outlook for coarse grains, particularly corn, is that strong income growth in China will strengthen meat demand and corn consumption, resulting in China becoming a net corn importer after 2000. Higher coarse grain imports by China and developing countries in Asia and Latin America are expected to offset the import stagnation envisioned for the FSU, which was one of the world's largest importers during the 1980s.

Foreign coarse grain production is projected to increase through 2005, with stabilization in area reversing the severe downward trend over the 1980s. However, the rate of growth in yields, projected at 1.3 percent, is lower than in the previous decade. The rate of production growth is projected to be 1.5 percent; higher than in the 1980s, but well below the 1970s rate.

Foreign growth in consumption is expected to expand more rapidly than the relatively stagnant rate experienced in the 1980s. However, the projected annual rate of 1.6 percent through 2005 is still less than half the consumption gains of the 1970s. Most of the growth in consumption is expected to be in China and in higher-income developing countries, particularly those in Latin America and Asia.

Aggregate competitor exports remain basically flat throughout the mid- and late 1990s, then accelerate after the year 2000 as higher grain prices, specifically for corn and barley, stimulate production and exports. The U.S. share of the world coarse grain market is projected to grow steadily, reaching 62 percent by the end of the period. This market share would be only slightly below the 1979/80 record.

Buoyed by robust import demand for corn, U.S. exports of coarse grains are projected to grow 3.3 percent annually over the projection period. By 2000, U.S. exports are likely reach 61.6 MMT with corn exports accounting for 52.4 million tons. By 2005, U.S. coarse grain exports are projected to increase to 70.5 MMT, slightly below the record 71 million tons of 1979/80. U.S. corn exports will total 61 million tons by 2005, expanding to a 74 percent market share compared to the 1990-1993 average of 66 percent.

Importer Developments for Coarse Grains

Imports by the FSU are projected to remain flat, constrained by lack of foreign exchange and credit availabilities, as well as slow growth in livestock production. The FSU is projected to increase corn imports to only 5 MMT by 2005, half the levels of the early 1990s.

Strong increases are projected in China's corn and malting barley imports. While corn imports are expected to grow steadily, a continuation of corn exports from the northern part of China will keep China a net exporter until after 2000. Strong demand is anticipated for malting barley for beer production.

World Coarse Grain Trade

Countries	Average 1992-94	1996	2000	2005	Growth 1996-2005
Million metric tons					
Importers					
China	1.1	1.8	3.6	9.6	7.9
Mexico	4.9	7.1	9.8	11.6	4.6
Korea	6.9	8.6	10.6	12.3	3.7
Saudi Arabia	5.3	6.0	6.6	7.7	1.7
Malaysia	2.2	2.4	2.9	3.6	1.2
South Africa	0.0	0.0	0.2	1.0	1.0
Taiwan	5.8	6.0	6.4	7.0	1.0
Sub-Saharan Africa	1.4	1.5	2.0	3.4	1.9
Japan	21.2	20.8	20.7	20.1	-0.7
FSU	7.1	5.3	5.5	5.9	0.6
E. Europe	2.3	1.0	0.5	0.5	-0.5
Thailand	0.2	0.4	0.4	0.6	0.2
Rest of world	28.2	28.3	30.0	30.4	2.1
Total imports	86.6	89.2	98.9	113.7	24.5
Exporters					
U.S.	47.3	52.7	61.6	70.5	17.8
Argentina	5.5	6.6	8.7	11.9	5.3
E. Europe	0.7	1.5	3.4	6.2	4.8
China	10.0	8.0	6.0	4.2	-3.8
Canada	4.9	5.3	6.1	7.3	2.0
Australia	2.2	2.7	1.7	1.8	-0.9
FSU	1.5	1.1	1.6	1.8	0.7
South Africa	3.0	0.9	0.3	0.3	-0.6
EU-12	8.3	8.2	7.8	7.7	-0.4
Thailand	0.3	0.0	0.0	0.0	0.0
Rest of world	3.0	2.2	1.8	2.0	-0.2
Total exports	86.6	89.2	98.9	113.7	24.6
Percent					
U.S. trade share	54.6	59.2	62.2	62.0	--

Mexico's corn imports are projected to grow strongly through 1999 and then slow as domestic price declines moderate and a continued decline in per capita food use constrain import growth. Initially, higher corn imports will be partly offset by lower sorghum imports. While the PROCAMPO policy that reduces high support prices to corn farmers is expected to strengthen import demand, a very gradual price decline for corn will constrain expansion in sorghum area. Sorghum imports will expand in the baseline, reaching over 5 MMT by 2005, slightly higher than the record imports of 1991.

South Korea's corn imports are expected to rise rapidly as limited availability of competitively priced feed wheat strengthen coarse grain demand. South Korea is additionally expected to increase because of expanding livestock production. Imports could be slightly lower if meat imports are higher than projected.

Saudi Arabia's barley imports will rise in response to a growing livestock sector. Domestic production of barley is constrained as the policy of shifting irrigated wheat area to barley has been modified by placing quotas on barley output.

Japan's coarse grain imports are expected to decline, mirroring a contraction in feed consumption as meat imports increase. The projected drop in feed demand is expected to be only partially offset by stronger imports of industrial-use corn in response to minimum access requirements under GATT. However, with imports projected at 20.1 MMT in 2005, Japan will easily remain the world's largest coarse grain importer.

Exporter Developments for Coarse Grains

Argentina's corn exports are projected to increase steadily and surpass China as the largest foreign corn exporter. Current policy reforms are expected to result in increased marketing efficiencies, higher production, and exports.

East European projected growth in exports could be undermined if international prices are lower than projected.

The EU is projected to increase coarse grain exports by 2000 because EU coarse grains export limits specified by the GATT are higher than recent export levels. However, these limits will probably not be met in the next few years. Relative prices, which favor wheat feeding over coarse grains, as well as less constraining limits to coarse grain exports, are projected to pressure EU policy makers to increase coarse grain restitutions and exports. The higher prices should induce some expansion of coarse grain area and production in the medium term. Subsidized export limits are expected to be constraining after 2000 when subsidized coarse grain exports level off.

Thailand is projected to become a net importer as a result of rapidly rising domestic use of corn for feed. South Africa emerges as a net importer midway through the projection period.

Soybean Trade

World exports of soybeans and soybean meal, on a soybean equivalent basis, are projected to rise 6 MMT to 82.7 MMT during the 1996 to 2005 projections period. Increases in soybean meal trade drive these gains until the end of the decade, while soybeans account for most of the growth after 2000. Global soybean exports trend upwards at 1.8 percent per year, slightly slower than the 2.2 percent growth rate for soybean meal exports.

Foreign soybean production is projected to climb 2.7 percent per year to 85.3 MMT in 2005, slowing from the strong growth found in the 1970s and 1980s when Brazil and Argentina incorporated large amounts of land to the production of soybeans.

Gains in world soybean meal consumption will be smaller until the end of the century due to weak demand from the FSU, Japan, and the EU. However, strong economic growth by developing economies will then raise consumption growth to 2.7 percent, unchanged from levels attained in the 1980s.

By 2005, U.S. exports of soybeans and soybean meal are projected to rise to 23.3 and 6.2 MMT, respectively. The U.S. market share for soybean exports drops from 67 percent in 1995 to about 63 percent by 2005, while U.S. soybean meal trade share drops marginally to 17 percent.

Importer Developments for Soybeans

Developing economies account for more than 60 percent of soybean meal import growth. Demand will expand rapidly in the South East Asian countries of the Philippines, Indonesia, Malaysia, and Thailand, Latin America, the Middle East, and North Africa. Strong income and population growth is expected to support substantial increases in the livestock sectors in these regions.

Soybean Trade Baseline Projections

Countries	Average 1992-94	1996	2000	2005	Growth 1996-2005
Million metric tons					
Importers					
EU	14.2	13.8	13.8	15.2	1.4
Mexico	2.2	2.7	3.2	4.0	1.3
China	0.1	0.3	0.6	1.3	1.0
South Korea	1.2	1.1	1.2	1.3	0.2
Taiwan	2.4	2.4	2.5	2.6	0.2
FSU	0.3	0.4	0.5	0.5	0.1
Eastern Europe	0.3	0.5	0.6	0.6	0.1
Japan	4.8	4.8	4.7	4.7	-0.1
Rest of World	4.7	4.9	5.6	6.6	1.7
Total imports	30.2	31.0	32.7	36.8	5.8
Exporters					
U.S.	19.5	20.7	20.8	23.3	2.6
Brazil	4.7	4.2	5.0	5.8	1.6
Argentina	2.8	3.1	3.6	4.2	1.1
China	0.6	0.6	0.5	0.4	-0.2
Rest of World	2.4	2.4	2.8	3.2	0.8
Total exports	30.0	31.0	32.7	36.8	5.8
Percent					
U.S. trade share	65.0	66.7	63.7	63.2	--

Soybean Meal Trade Baseline Projections

Countries	Average 1992-94	1996	2000	2005	Growth 1996-2005
Million metric tons					
Importers					
Southeast Asia	2.3	2.8	3.6	4.5	1.7
N. Africa & Mid East	2.7	3.4	3.8	4.7	1.3
FSU	1.3	1.3	1.7	2.2	0.9
Latin America	2.3	2.8	3.1	3.6	0.8
Eastern Europe	1.6	1.9	2.1	2.5	0.6
China	0.0	0.2	0.4	0.6	0.4
EU	14.5	13.9	14.0	14.6	0.1
Canada	0.6	0.6	0.6	0.6	0.0
Japan	0.9	0.8	0.6	0.5	-0.3
Rest of World	2.2	2.5	2.8	3.1	0.6
Total imports	28.4	30.2	32.8	36.7	6.5
Exporters					
Brazil	9.3	9.6	10.5	11.9	2.3
Argentina	6.9	7.2	8.0	8.8	1.6
India	2.0	2.7	3.5	3.9	1.2
U.S.	5.2	5.3	5.4	6.1	0.8
EU	3.9	3.9	3.9	4.3	0.4
China	0.6	0.4	0.4	0.3	-0.1
Rest of World	0.9	1.1	1.3	1.4	0.3
Total exports	28.8	30.2	32.8	36.7	6.5
Percent					
U.S. trade share	18.1	17.5	16.3	16.6	--

In the EU, CAP reform, the GATT, and the U.S.-EU Oilseed Agreement, will result in EU imports of soybeans and soybean meal, on a soybean equivalent basis, to decline marginally through 1999, but resume growth during 2000 to 2005, especially for soybeans. CAP reform promotes usage of feed grains rather than protein meals. The U.S.-EU Oilseed Agreement limits the expansion of oilseed area, thus reducing domestic production. As edible oil consumption rises in the EU, soybean import growth resumes. Growth in soybean meal use will likely accelerate beyond 2000 as the grain substitution effect subsides.

China is projected to become a net importer of soybeans and soybean meal by the year 2000. It is expected that China will maintain policies restricting soybean meal imports in favor of soybean imports.

Eastern Europe's soybean meal imports are projected to climb throughout the period. Economic reforms will stimulate income growth and production of hogs and poultry will begin to grow again.

Exporter Developments for Soybeans

South American production growth will drop from a 6 percent annual rate in the 1980s to around 3 percent for 1996 to 2005. Domestic policies in Argentina and Brazil will continue to favor soybean meal exports over soybean exports. However, greater domestic consumption, especially in Brazil, will reduce the growth of soybean meal availability for exports.

In China, major reductions in the volume of soybean and soybean meal exports have already occurred, but exports are assumed to continue to decrease as an increasing share of soybean production will be used to meet the growing demands of its livestock sector.

Implications for U.S. Trade

The USDA baseline portrays a 10-year scenario of increasing world demand and prices, although not at the robust pace of the 1970s. For U.S. agriculture, that means there is an opportunity to increase production and exports -- if we are competitive in world markets. Compared to 1992-94 average exports, the baseline for 2005 projects increases in exports for:

Projected increase in U.S. exports, 1996-2005

Commodity	Million metric tons
Wheat	6.9
Rice (net exports)	-0.7
Coarse grains	17.8
Soybeans	2.6
Soybean meal	0.8

Of course, these baseline projections are based on many assumptions, and the conditions that actually emerge are bound to change. But the export prospects for most of U.S. agriculture appear to be more optimistic than they have been for the past decade.

GRAINS AND OILSEEDS OUTLOOK

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Opening Remarks.

Good morning. It is a pleasure to present USDA's domestic outlook for grains and oilseeds. I would like to begin by thanking all those individuals that have made contributions to prepare these baseline projections and make this forum possible.

This baseline will be used to measure the impacts of legislative alternatives to reduce the budget deficit and develop the 1995 Farm Bill. Budget reduction efforts and the 1995 Farm Bill deliberations have put virtually all programs "on the table" for review.

In this presentation, I will update the 1994/95 wheat, corn and soybean baseline projections with a few comments regarding the 1995/96 situation. Next, I will discuss three important policy and working assumptions: (1) the Conservation Reserve Program (CRP) assumptions; (2) ethanol assumptions; and (3) corn and soybean trend yield assumptions. These assumptions are important to the baseline projections because of the considerable uncertainty regarding their outcome and the potentially large impacts on the longer-term outlook for grains and oilseeds. I will conclude with a brief overview of the long-term outlook for grains and oilseeds.

Updating 1994/95 and 1995/96 Forecasts.

The 1994/95 forecasts for wheat, feed grains, and oilseeds used in the baseline were from the December 12, 1994 issue of the World Agricultural Supply and Demand Estimates. A brief discussion is warranted to highlight 1994/95 supply and demand changes that have occurred since these estimates were prepared and their potential impact on the 1995/96 outlook.

Wheat.

The wheat 1994/95 supply and demand balance sheet has been revised modestly since the baseline was prepared in December. Table 1 compares 1994/95 December forecasts with February 1995 forecasts and shows updated 1995/96 projections.

Table 1. Wheat Supply, Demand, and Prices: Comparison of 1994/95 December 1994 vs. February 1995 Forecasts and 1995/96 Projections.

Item	Units	1994/95 <u>1/</u>			1995/96
		Dec. 1994	Feb. 1995	Change	
Planted	mil. ac.	70.5	70.4	-0.1	71.0
Harvested	mil. ac.	61.7	61.8	+0.1	62.3
Yield	bu./ac.	37.6	37.6	0.0	38.5
Production	mil. bu.	2,320	2,321	+1	2,400
Feed & Residual	mil. bu.	225	250	+25	225
Food, Seed, & Industrial	mil. bu.	982	973	-9	988
Exports	mil. bu.	1,250	1,300	+50	1,200
Total Use	mil. bu.	2,457	2,523	+66	2,413
Ending Stocks	mil. bu.	518	456	-62	528
Farm Price <u>2/</u>	\$/bu.	3.45	3.45	0.00	3.30

1/ Source: World Agricultural Supply and Demand Estimates, December 9, 1994 and February 10, 1995.

2/ Mid-point of average farm price forecast.

Feed and residual use has been increased 25 million bushels because the December 1, 1994 stocks released in January indicated a larger second quarter usage than expected. U.S. exports have also been increased by 50 million bushels primarily reflecting larger imports by China and Egypt. Despite tighter 1994/95 estimated ending stocks, the mid-point price forecast is unchanged compared with baseline projections--a reflection of ongoing data on prices received by producers.

Turning to 1995/96, wheat planted acreage is expected to be 0.6 million acres higher than this year. Winter wheat seedings for 1995 were less than expected earlier, but this will be offset somewhat by increased spring wheat seedings, especially in Montana. These plantings, a planted to harvested ratio near last year's level, and an assumed yield of 38.5 bushels per acre give a crop of 2.4 billion bushels.

Food use in 1995/96 is expected to increase 15 million bushels, consistent with historical year-to-year increases, but feed and residual use will likely drop. U.S. exports in 1995/96 are expected to decline because of increased competition from expanding production in most major foreign exporting countries.

Ending stocks are expected to increase 72 million bushels and farm prices are expected to average around \$3.30 per bushel.

Corn.

The corn 1994/95 supply and demand balance sheet has changed noticeably since the baseline was prepared in December. Table 2 compares 1994/95 December forecasts with February 1995 forecasts and shows updated 1995/96 projections.

Table 2. Corn Supply, Demand, and Prices: Comparison of 1994/95 December 1994 vs. February 1995 Forecasts and 1995/96 Projections.

Item	Units	1994/95 <u>1/</u>			1995/96
		Dec. 1994	Feb. 1995	Change	
Planted	mil. ac.	79.1	79.2	+0.1	76.5
Harvested	mil. ac.	72.3	72.9	+0.6	69.3
Yield	bu./ac.	138.4	138.6	+0.2	125.5
Production	mil. bu.	10,010	10,103	+93	8,700
Feed & Residual	mil. bu.	5,500	5,650	+150	5,500
Food, Seed, & Industrial	mil. bu.	1,685	1,700	+15	1,820
Exports	mil. bu.	1,750	1,950	+200	1,775
Total Use	mil. bu.	8,935	9,300	+365	9,095
Ending Stocks	mil. bu.	1,930	1,658	-272	1,268
Farm Price <u>2/</u>	\$/bu.	2.15	2.20	+.05	2.35

1/ Source: World Agricultural Supply and Demand Estimates, December 9, 1994 and February 10, 1995.

2/ Mid-point of average farm price forecast.

Even though the 1994 corn crop size increased 93 million bushels, domestic and export usage increased 365 million bushels, resulting in a reduction of the forecast ending stocks of 272 million bushels. Despite the large decline in ending stock estimates, the mid-point of the average farm price range increased only 5 cents per bushel, largely because harvest-time low prices of around \$2.00 per bushel were already weighed into the market year price forecast.

The feed and residual forecast was increased from December because stocks at the end of the first quarter were lower than anticipated, implying larger first quarter usage.

The corn export forecast was increased for a number of reasons such as a smaller crop size

for South Africa, but the major reason was a change in the trade position for China. Last November we were forecasting China to export 9 million tons of corn and no imports. Now, we have only 3 million tons of exports and 2.5 million tons of imports.

Turning to the 1995/96 outlook, the forecast of corn acreage is expected to be 76.5 million acres. Corn prices have strengthened relative to soybeans since December, but the response may be dampened by the recent increases in fertilizer prices. The extent that producers forward priced fertilizer needs or applied fertilizer in the fall before the runup in fertilizer prices will also be a factor in the final corn planted acreage.

Using a trend yield of 125.5 bushels per acre results in a 1995 corn crop size of 8.7 billion bushels. Total supplies for 1995/96 are expected to be about 0.6 billion bushels lower than in 1994/95.

The 1995/96 corn total use is expected to be about 9.1 billion bushels. Even though total use is expected to be lower than in 1994/95, it would be the second highest on record. Feed and residual is expected to decline to 5.5 billion bushels because of reduced 1995/96 supplies and higher prices. Food, seed, and industrial (FSI) use is expected to increase from 1.7 to over 1.8 billion bushels, assuming that the Environmental Protection Agency (EPA) regulations regarding ethanol's role in the renewable fuels oxygenate standard will be upheld by the court. Exports are expected to be almost 1.8 billion bushels, down from almost 2.0 billion bushels in 1994/95. We expect a corn stock drawdown of about 0.4 billion bushels. The stocks-to-use ratio is expected to be about 14 percent and a corn price forecast of around \$2.35 per bushel.

While each of the supply/demand components are important the most uncertainty on the demand side is the FSI use and exports. I will discuss the FSI use later, but for exports the major reason for the decline is that we have assumed China will be a net exporter of 5 to 6 million tons of corn.

Soybeans.

The 1994/95 soybean production was raised 35 million bushels since baseline projections were prepared in December. The production increase reflects an increase in yield to 41.9 bushels per acre compared with 41.5 bushels in December, and an increase of almost 0.3 million harvested acres. Demand for 1994/95 remains almost unchanged from December with crush up 10 million bushels to 1.365 billion in February and projected exports unchanged at 785 million bushels. Domestic and total use projections for 1994/95 would be the highest on record. The record large crop in 1994 and the likelihood of a large South American soybean crop in 1995 will push ending stocks to almost record levels, despite record use in 1994. Stocks are projected up 30 million to 510 million bushels, the second highest level on record. The soybean price forecast is \$5.35 per bushel based on monthly prices through January, up 5 cents from the baseline projection. Table 3 compares baseline

forecasts with February forecasts for 1994/95.

Table 3. Soybeans Supply, Demand, and Prices: Comparison of 1994/95 December 1994 vs. February 1995 Forecasts and 1995/96 Projections.

Item	Units	1994/95 <u>1/</u>			1995/96
		Dec. 1994	Feb. 1995	Change	
Planted	mil. ac.	61.9	61.9	0.0	59.5
Harvested	mil. ac.	60.8	61.1	+0.3	58.4
Yield	bu./ac.	41.5	41.9	+0.4	36.5
Production	mil. bu.	2,523	2,558	+35	2,130
Crush	mil. bu.	1,355	1,365	+10	1,355
Seed & Residual	mil. bu.	117	115	-2	110
Exports	mil. bu.	785	785	0	770
Total Use	mil. bu.	2,257	2,265	+8	2,235
Ending Stocks	mil. bu.	480	510	+30	410
Farm Price <u>2/</u>	\$/bu.	5.30	5.35	+.05	5.55

1/ Source: World Agricultural Supply and Demand Estimates, December 9, 1994 and February 10, 1995.

2/ Mid-point of average farm price forecast.

The outlook for soybeans for 1995/96 changed little between December and February. The 30 million bushel increase in projected supplies reflects higher 1994/95 ending stocks discussed earlier. Producers are projected to plant 59.5 million acres in 1995, unchanged from the baseline level, but about 2.5 million lower than in 1994. The decline from 1994 reflects lower soybean prices and the effect of a 7.5 percent corn acreage reduction program (ARP) percentage for the 1995 crop. Since the December acreage projection, higher cotton prices and lower than expected winter wheat seedings have had offsetting effects on projected soybean acreage for 1995. Despite lower acreage and a return to trend yields, supplies are projected at near record levels due to high stock levels.

Projected use of soybeans remains almost unchanged from baseline levels. Domestic crush is lower by 5 million bushels; exports are unchanged. The 1995/96 use forecast, if realized, would be the second highest on record behind 1994/95. Stocks are projected to decline 100 million bushels to 410 million at the end of the marketing year. The season average price is projected to be \$5.55 per bushel, 10 cents lower than was projected in the baseline.

Key Baseline Assumptions.

CRP. (See Chart 1).

On December 14, 1994, USDA announced CRP contract modification and extension actions that included (1) offering all contract holders the opportunity to extend and modify existing contracts, (2) offering selected contract holders the opportunity to be released from their contracts prior to maturity, (3) offering an opportunity to enroll new replacement acreage for the "early release" lands, and (4) offering easements for selected contracts and practices. In an earlier announcement, contract holders with CRP acreage that becomes available for planting for the 1996 crop were allowed to extend their contracts for one year. These actions are incorporated into the baseline.

Of the 36.4 million acres currently under CRP contract, about 4.5 million acres are expected to be released by contract holders early, then replaced with newly enrolled acreage. Contract holders are expected to extend or modify about 26 million acres. This assumption is consistent with contract holder surveys conducted by the Soil and Water Conservation Society that showed about 25 percent of contract holders had no interest in extending their CRP contracts. The baseline also included a signup of an additional 1.6 million acres to reach the 38.0 million acre statutory level.

The outcome of these announcements may differ from the baseline assumptions because the regulations for implementing these announcements have not been determined and the actual level of allowed participation will be subject to the availability of appropriated funds. The "early release" signup is expected to begin this spring. New acres to replace the early release land are expected to be enrolled in a signup prior to October 1995. The extension and modification feature will likely occur after this summer. By statute, the signup for the 1.6 million acres needed to meet the 38.0 million acre goal must be held during the October 1995 - December 1995 period, subject to appropriations.

Corn Yields.

Another big factor in the baseline projections for corn is the trend yield assumption, particularly because of the large yield variations experienced in recent history. Regressing U.S. corn yields over time for the period 1960 to 1994 results in a simple linear trend yield for corn of about 125.5 bushels per acre for 1995.

USDA publishes the number of harvested ears per acre for the 10 objective yield states. Ear weights can be calculated by taking the yield in bushels per acre, converting it to pounds per acre, then dividing by the ear count to get the pounds per ear. An examination of this data for the 1979-94 period indicates that most of the trend increase in corn yields is due to more harvested ears per acre rather than ear weights. Using a trend ears per acre and an average ear weight (1979-94, excluding 1983, 1988, and 1993) gives a yield of around 126.5 bushels,

in line with our trend yield forecast.

Soybean Yields.

The tightening soybean supply-use balances over the projection period is very much contingent on yield assumptions which have become much more uncertain recently. Yields in 1994/95 at 41.9 bushels per acre are more than 2 standard errors above the 1970-94 U.S. trend yield. Moreover, yields were abnormally high in 1992/93 for the U.S. The higher-than-normal yields tend to be more pronounced in the mid-South and parts of the Eastern Corn Belt and have been quite apparent for the past 5 years in these areas. Our baseline projections, which are higher than a U.S. trend based estimate, give some weight to these regional influences.

An examination of limited data on pod counts for a seven-State region published by USDA's Crop Reporting Service points to a strong increase in pod count and plant population per acre since 1987/88. The interesting part of this data is that pod weight declines only slightly with increased pod counts. Historically, this was not considered to be the case with older soybean varieties. Use of this data drawn from objective yield analyses for the seven-State region, suggest U.S. soybean yields could be substantially higher than a U.S. trend estimate in 1995/96 and beyond, based on this limited information about pod counts and weights.

Ethanol. (See Chart 2)

Significant increases of corn FSI use in the baseline period are largely attributable to corn processed into ethanol. Under the baseline, it is assumed that the renewable oxygenate requirements (ROR) contained in the EPA's final rule published on June 30, 1994 will be upheld by the court. Under the Clean Air Act, selected metropolitan (attainment) areas must use oxygen-enhanced fuels to meet clean air standards. Further, ROR's mandate that 15 percent of the oxygenate requirement under the Clean Air Act must be satisfied with fuel from renewable sources (primarily ethanol) during calendar year 1995 and 30 percent beginning in calendar year 1996. Implementation of the final rule has been delayed under a court order pending resolution of a lawsuit, but a ruling is expected in mid-1995.

The near-term impact of the delay is unclear. Methanol, the alcohol feed stock for MTBE, (an ethanol substitute) prices have recently risen to levels that make ethanol an economical substitute. Methanol supplies have tightened because of increased worldwide demand for products containing methanol (plywood, paint, chemicals), increased demand for oxygenates caused by the implementation of the Federal reformulated gasoline program and greater use of oxygenates worldwide, and insufficient capacity that has not been expanded for some time (decreased with the recent explosion of a methanol plant near Houston).

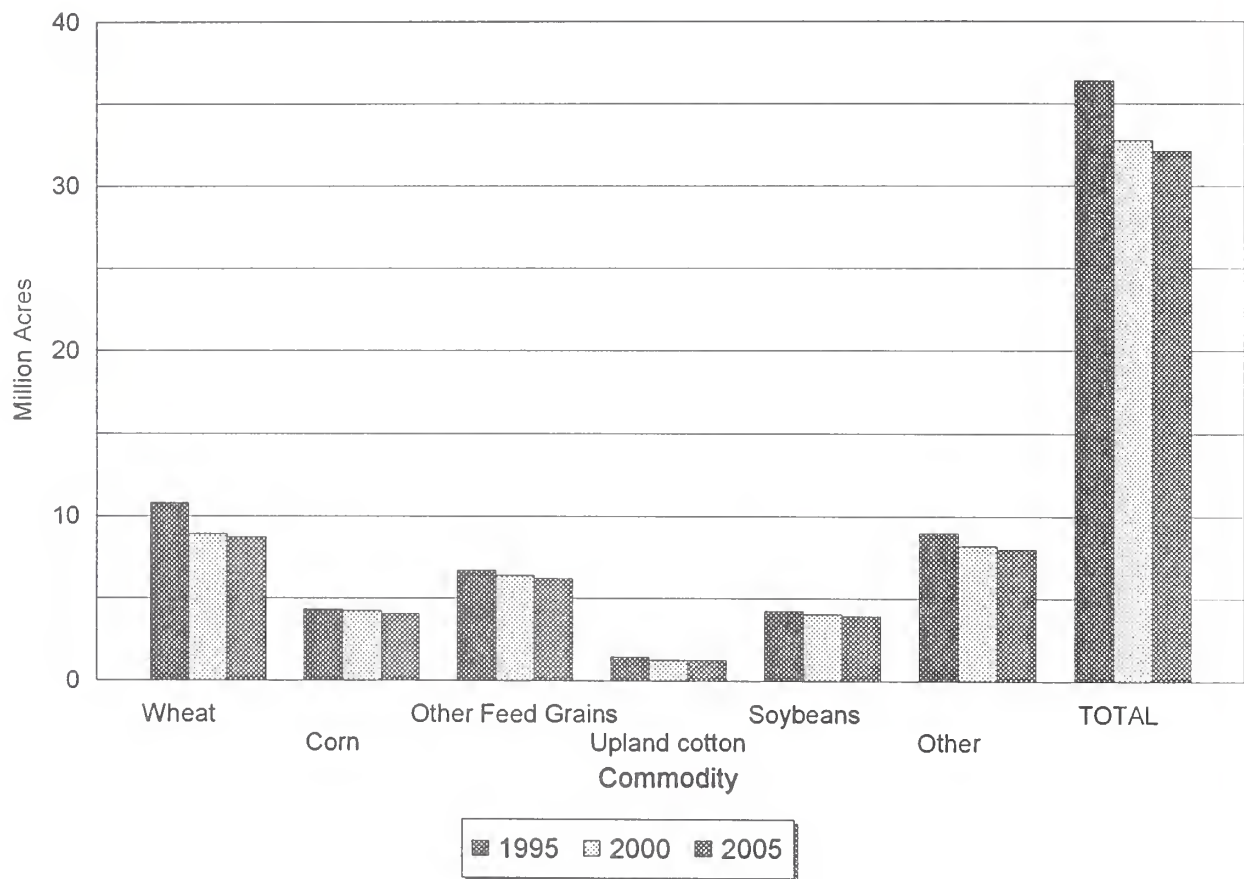
Ultimately, the length of time that methanol prices remain high relative to ethanol and the resolution of the lawsuit will likely greatly influence the amount of corn used to make

ethanol.

The Long-Term Baseline Picture.

Ron Trostle has given you the international operating environment for the U.S. grains and oilseeds sectors. Rising global incomes are generating strengthening demand for U.S. grains and oilseeds. Domestic food and feed demand rises moderately, while use of corn for fuel alcohol and other industrial uses rises at a somewhat stronger pace. Overall, global demand is rising faster than yields leading to tightening supply/demand balances and boosting prices. This pulls land back into production. Wheat and feed grain ARP levels are set at zero percent and the CRP is continued, levelling off slightly above 32 million acres during the last half of the baseline period (see Chart 3). Acreage idled under the 0,85-92 provisions is the only acreage idled under the annual programs. By marketing year 2005/06, average farm prices per bushel reach \$3.80 for wheat, \$2.75 for corn, and \$6.95 for soybeans.

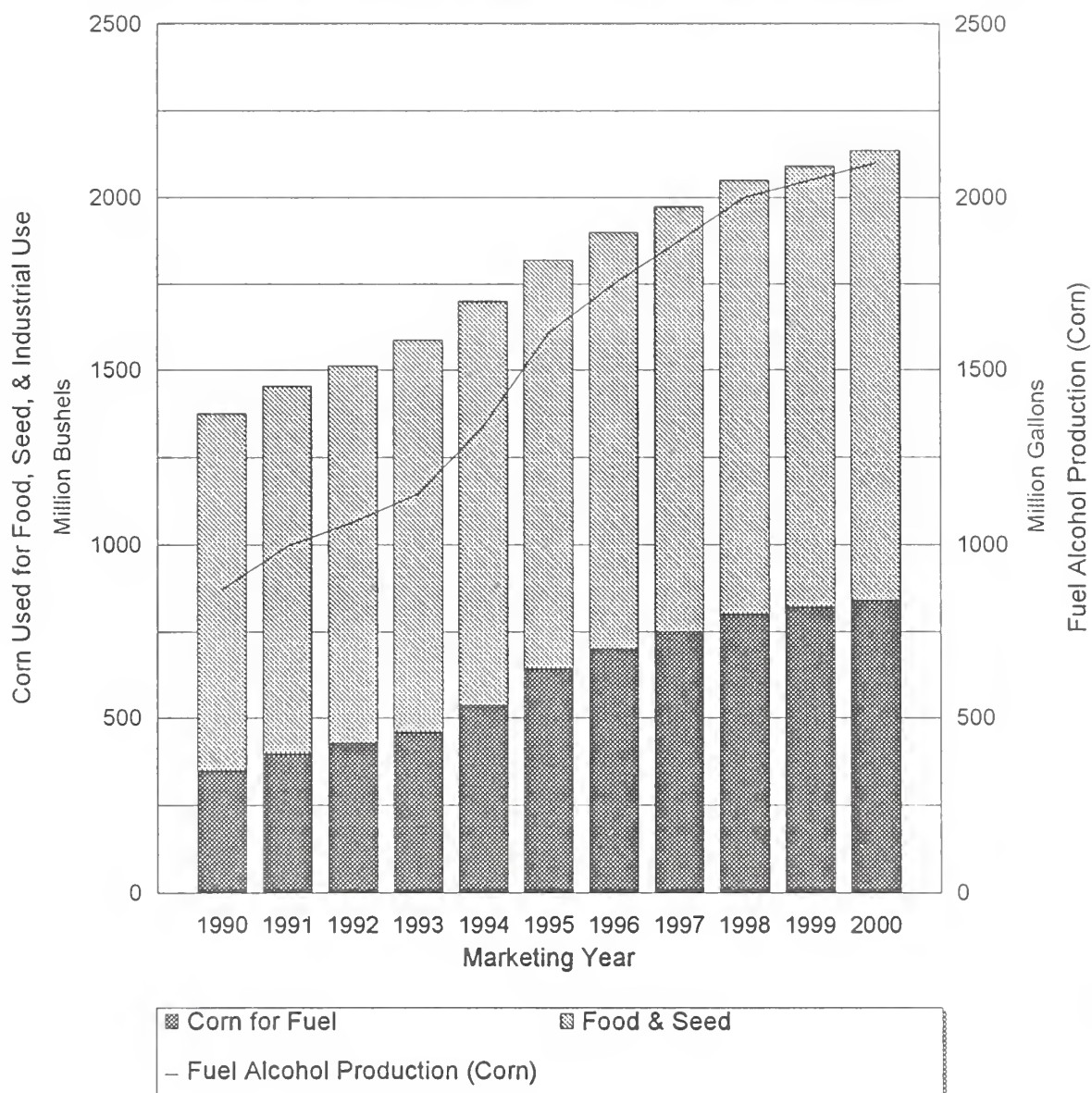
Chart 1. CRP Acreage By Commodity
1995 vs. 2000 vs. 2005



Source: USDA/CFSA/EPAS/GAD/2-20-95

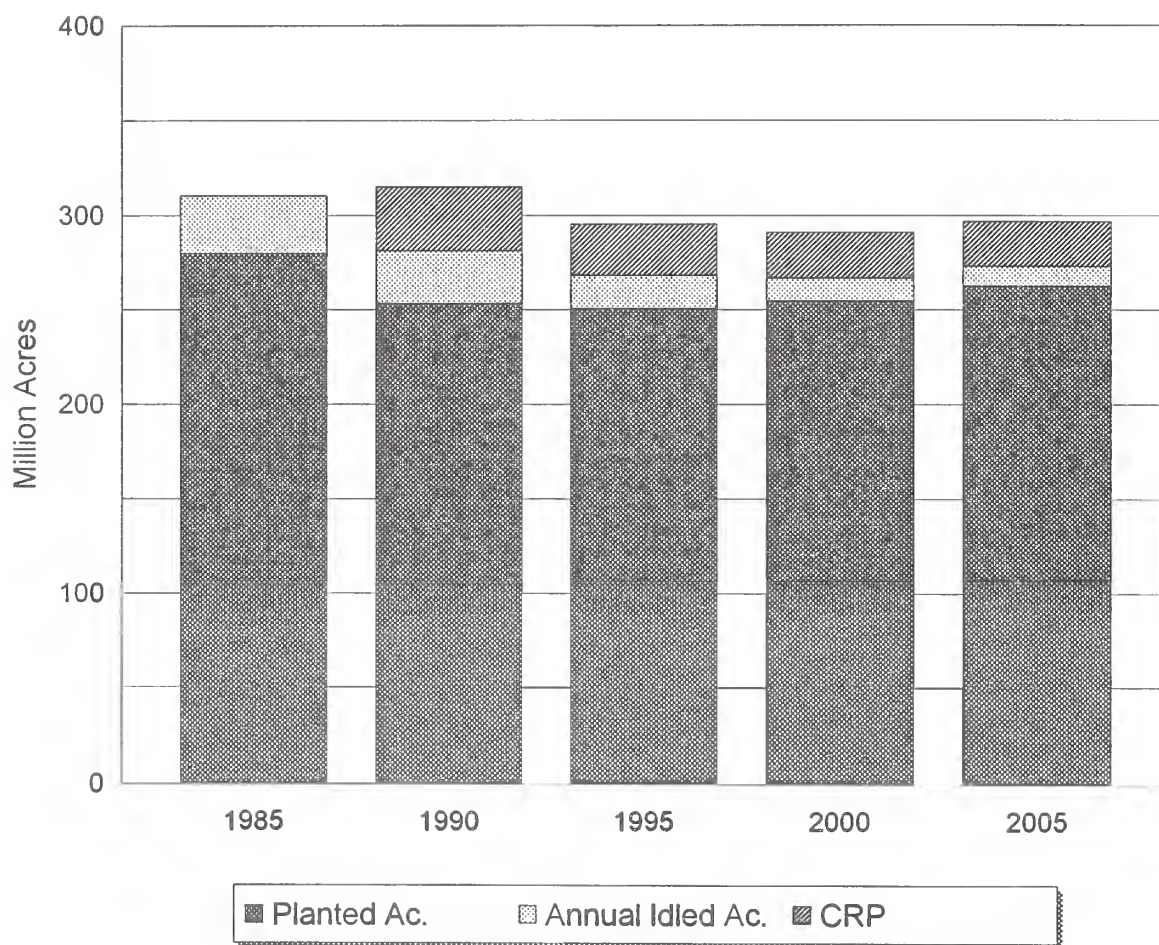
Chart 2. Corn: Food, Seed, & Industrial Use

Marketing Year's 1990-2000



Source: USDA/CFSA/EPAS/GAD/2-20-95

Chart 3. Planted, Annual Idled, and CRP Acreage
Eight major crops -- 1985, 1990, 1995, 2000, and 2005



CRP = Conservation Reserve Program

Eight crops include wheat, feed grains, upland cotton, rice and soybeans

Source: USDA/CFSA/EPAS/GAD/2-20-95

U.S. Yield Prospects: Was 1994 an Aberration?

Rod Greder, Ph.D.
Director of Marketing
Cargill Hybrid Seeds
Minneapolis, Minnesota

Presented at the 1995
Agricultural Outlook Forum
Arlington, Virginia
February 23, 1995

1995 Agricultural Outlook Forum

U.S. Yield Prospects: Was 1994 an Aberration?



↗ Corn

↗ Soybeans

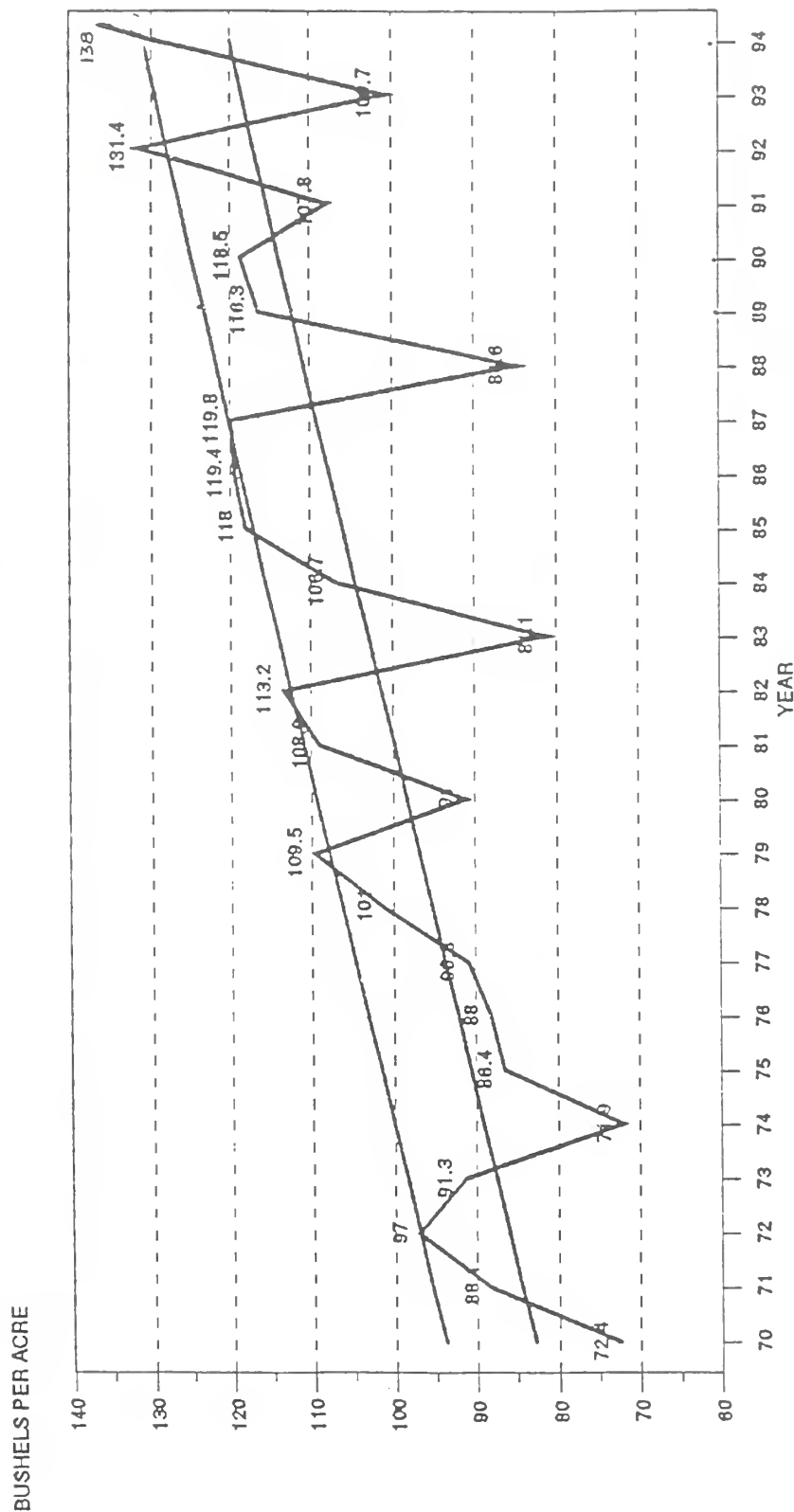
Factors that will affect Future Corn and Soybean Yields

- Refinement of Traditional Management Practices
- Cumulative Plant Breeding Improvements
- Emerging Production Technologies
- Biotechnology's Tools and Genes
- Uncontrollable Environmental Influences
- Requirements of End-users of Corn and Soybean Products
- Optimization of Input Costs and Market Prices
- Government Policies and Environmental Regulations

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Arlington, VA

HISTORICAL CORN YIELD

U.S. AT THE NATIONAL LEVEL



USDA ACTUAL CORN YIELD 1970-93 BASED TREND TREND REGRESSION PLUS 11 BPA

1994 YLD IS CRP AUG 15 EST.

1995 Agricultural Outlook Forum

U.S. Yield Prospects: Was 1994 an Aberration?



Corn



Soybeans

Refinement of Traditional Management Practices

- Increased Plant Densities
- Decreased Row Widths
- Improved Weed and Insect Control
- Improved Fertility Programs
- Increased Timeliness of Field Operations
- Optimization of Tillage Practices
- Refined Irrigation Techniques

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↗ Corn

↗ Soybeans

Emerging Production Technologies and Practices

- Site-Specific Production Practices to Optimize Yields - Variable Rate Technology and Yield Monitoring
- Seed Treatments and Coatings
- Herbicides with Better Effectiveness and Improved Crop Tolerance?
- Reduced Tillage Systems
- Explosion of Information Technology

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↑ Soybeans
↑ Corn
↑

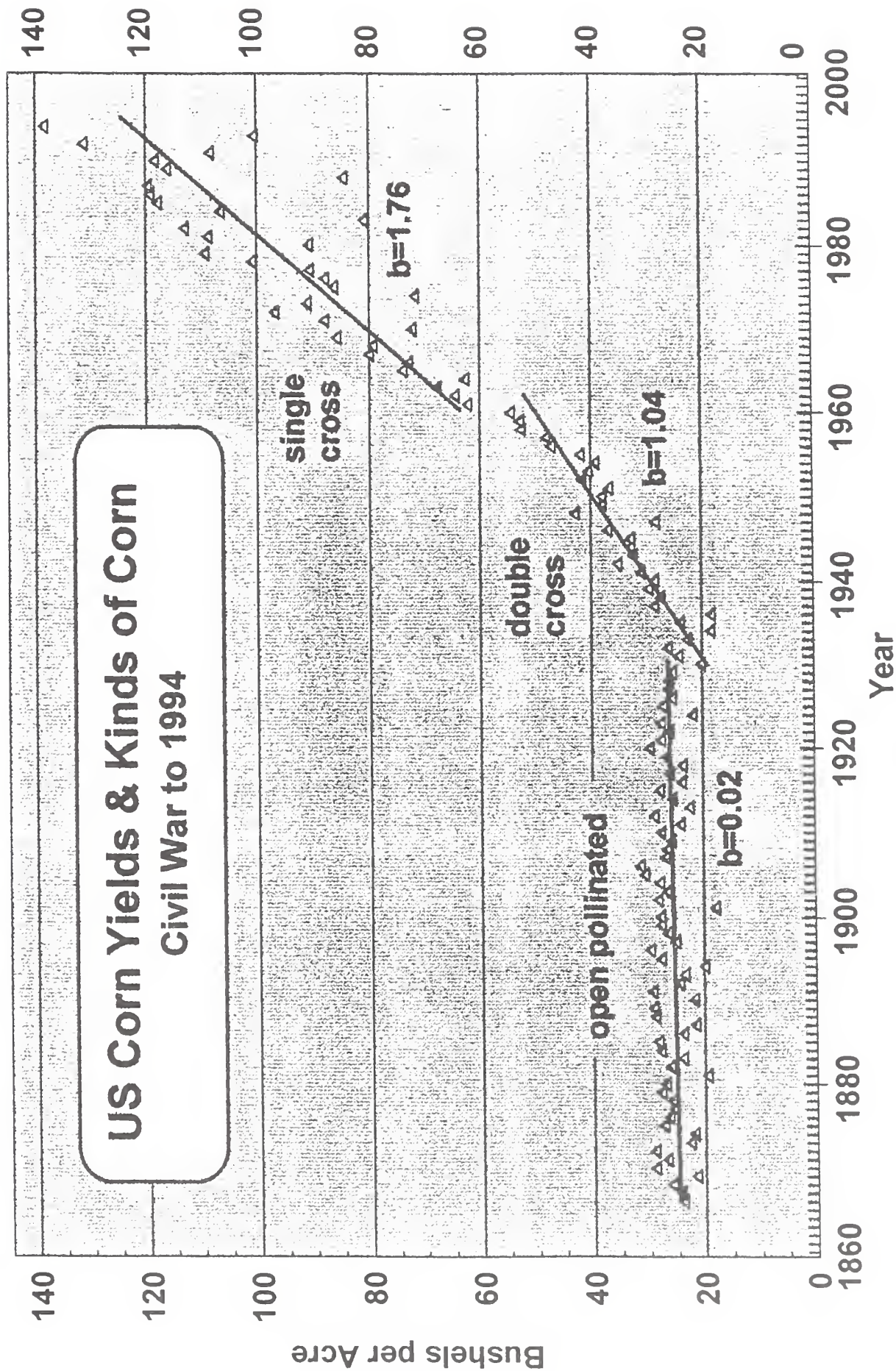


Corn

➔ Soybeans

- ## Soybeans

- February 23, 1995
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U.S. Yield Prospects: Was 1994 an Aberration?



↗ Corn

↗ Soybeans

Yield Improvements Realized from Plant Breeding and Management

Corn

- Yield increases of 1.5 bu/ac/yr to 2 bu/ac/yr from 1940 to 1993
- Largest Gains since 1960 due Primarily to Genetics and Less so to Management (1.76 bu/ac/yr)
- Increases of 1% per year to 1.5% per year
- 55%-70% of increase is due to plant breeding (Duvick, 1984)

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↗ Corn

↗ Soybeans

Yield Improvements Realized from Plant Breeding and Management

Soybeans

- Yield increases of 0.3 bu/ac/yr to 0.4 bu/ac/yr from 1924 to 1993
(Graef and Specht, 1994)
- 1924-1943 - 0.43 bu/ac/yr
1944-1979 - 0.32 bu/ac/yr
1980-1993 - 0.56 bu/ac/yr
- Increases of 1% per yr (Significant Gains after 1970 PVPA are Due to Increased Private Breeding)
- 50% of increase is due to plant breeding (Specht and Williams, 1984)

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U.S. Yield Prospects: Was 1994 an Aberration?



↗ Corn

↗ Soybeans

Genetic Yield Potential for Corn and Soybeans

- **Realized On-Farm Yields**

- **Corn** -- ~ 370 bu/ac Measured in Farmer's Field
- Some Whole Farm Averages in Iowa exceeded 200 bu/ac in 1994
- State Average Yield of 156 bu/ac in Illinois in 1994

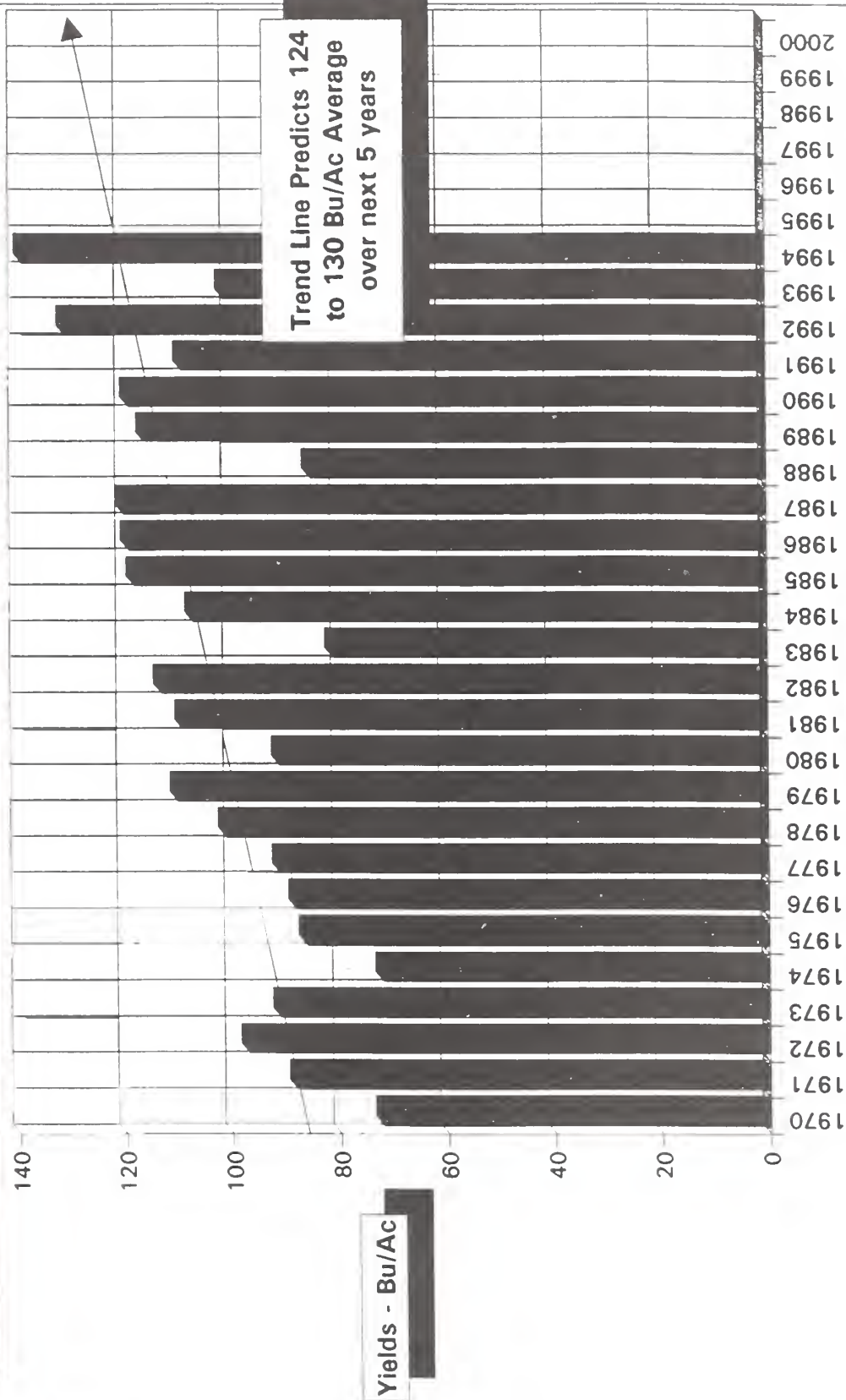
- **Soybean** -- ~ 100 bu/ac Measured in Farmer's Field
- State Average Yield of 51 bu/ac in Iowa in 1994

- **Theoretical Maximum Yields**

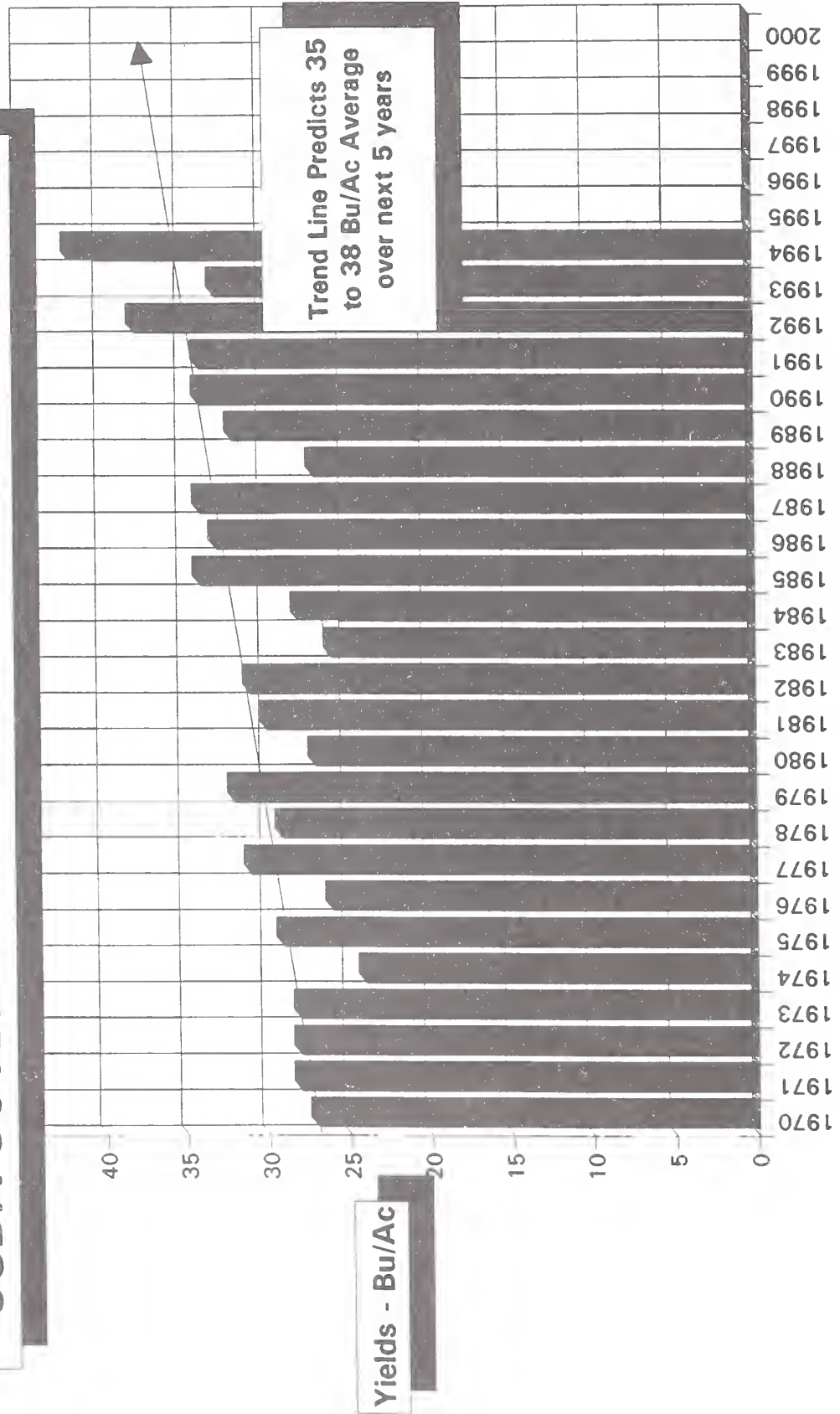
- Corn -- 490 bu/ac (Johnson, 1981)
- Soybean -- 225 bu/ac (Johnson, 1981)

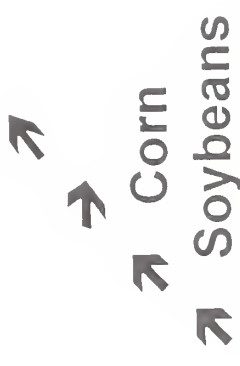
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USDA CORN YIELDS FROM 1970 TO 1994



USDA SOYBEAN YIELDS FROM 1970 TO 1994





Tools and Genes of Biotechnology and Genetic Engineering

- Correlate Molecular Markers to Expression of Yield in the Field to Increase Selection Effectiveness
- Incorporate Genes that Improve Yield and Yield Stability
 - Herbicide Tolerance
 - Insect Tolerance (*Bt* - Corn Borer Tolerance)
 - Disease Resistance
- Decrease Development Time to Speed New Product Introduction
- Incorporate Genes that Add Value to the Grain and Its Components

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U.S. Yield Prospects: Was 1994 an Aberration?



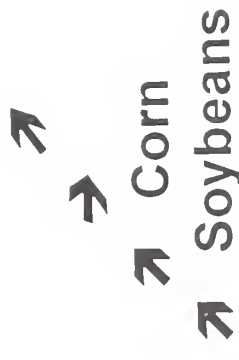
↗ Corn

↗ Soybeans

Additional Factors that may Affect Yield Gains

- Weather (El Nino)
- Requirements of End-users of Corn and Soybean Products
- Cost/Benefit Analysis of Input Costs versus Market Prices
- Intellectual Property Rights Issues will Affect R&D
- Federal Policies and Regulations
 - Water Usage Laws
 - Groundwater Contamination Legislation
 - Conservation Compliance
 - CRP, ARP, Decoupling

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Comments on Probability of Future Yield Increases

Cons

- R&D Costs to Genetically Improve Yields are Increasing and ROI's for Investors Will Need to be Maintained
- Weather Will Dominate Genetics/Management to Limit Maximum Yields
- Legislated Changes in Management Practices may have a Short-term Restrictive Effect on Yield Increases
- Yield Advances from Breeding may be Diluted by Selection for End-Use Traits and Defensive Traits

Pros

- Yield Swings Around the Trend Line will Decline as Stability is Bred In
- Yield Gains will Ebb and Flow as Genetics and Management Systems are Matched up over Time to Improve Yields
- Powerful Genetic and Production Technologies are Coming On-Line

February 23, 1995
Arlington, VA

HEADING TOWARD 2000, THE DAIRY OUTLOOK

James J. Miller
Agricultural Economist
Economic Research Service, USDA

The U.S. dairy industry will face dramatically different conditions during the next 5 years. New trade agreements, adoption of bST, and dramatic structural adjustments probably will make the industry look much different in 2000. Even so, the impacts of these changes may be no more than the forces that have shaken the industry since 1979.

Commercial Use

Much of what happens to the dairy industry during the rest of the century will be caused by changes in consumer demand. During the past 25 years, growth in commercial use has fairly consistently outpaced population increases, particularly since the early eighties. However, some long-standing demand trends appear to be changing.

Growth in cheese sales during the next 5 years is projected to be slower than in the past, at least in proportional terms. Fewer opportunities remain for consumers to discover new cheeses or new uses for cheese. Even so, cheese is expected to remain a main contributor to growth in dairy use.

The future of fluid milk sales is quite uncertain because long-established trends are changing substantially. Fluid milk sales are projected to edge higher but to show considerably less shift from whole milk to lowfat milk. Retail sales of butter are projected to continue to erode margarine sales--but at a much slower pace than in 1993-94.

In recent years, use of nonfat dry milk, butter, and cream in processed foods has been larger. Dairy products (even skim solids) are inexpensive ways of improving the quality and flavor of many food products. If such use continues to grow, commercial use of dairy products will expand more than expected.

Commercial use of dairy products is projected to grow about 2 billion pounds per year, just slightly more than population growth. Smaller declines in real retail prices and the maturing of the cheese market are expected to be the main reasons for slower expansion.

International Markets and Trade

International dairy markets during the next 5 years are expected to be less distorted than in the past. Subsidized exports will be limited by the GATT agreement and export supplies from Oceania, Eastern Europe, and South America are not expected to grow quickly. However, international market prices are projected to be generally below domestic prices.

The GATT agreement will require gradual increases in access to the U.S. market, particularly for milkfat. Imports are projected to increase as access is expanded. The new tariff rate quotas are expected to be filled at near historical rates.

Commercial export quantities are not projected to be substantial, although GATT and NAFTA will provide some boost. The U.S. will be competitive in some nearby and specialty markets, particularly with high value-added products. However, the amount of dairy products exported without subsidy is not expected to substantially affect the domestic supply-demand balance most of the period. The effects of the Dairy Export Incentive Program (DEIP) will wane because of GATT restrictions.

Milk Production

Bovine somatotropin (bST) obviously is a key factor in growth in milk per cow. We expect that the number of cows injected for the first time will be fairly modest for a few years following rapid adoption in 1994-95. The experience of the early adopters will be carefully scrutinized to discover optimal management practices. Use of bST will then again increase more rapidly.

Milk-feed price ratios are not expected to be very favorable. Producers probably will be conservative about boosting concentrate feeding. Milk-feed price ratios are projected to run about 1.5 to 1.6, levels historically associated with below-trend growth in milk per cow. Even with bST, gains in milk per cow are projected to be about 2 percent per year.

Structural adjustments will continue to be pronounced. However, expansion in western cow numbers is expected to slow from the torrid pace of recent years. Recent growth has relied on a combination of continued growth in established areas and development of local dairy industries where none existed before. Fewer such areas now exist, particularly prime pockets of under-exploited potential for commercial alfalfa production. In addition, dairy has become large enough that further growth can boost input costs--as evidenced by this seasons' alfalfa prices. The western industry will continue to develop and grow, just not quite as dramatically.

On the other hand, the traditional centers of milk production may be starting the most dramatic period of structural change since the adoption of bulk tanks. A new type of dairy farm is expected to emerge that is much larger, thereby lowering capital costs per cow. It also will use more purchased inputs (including labor) and will have the clear divisions of jobs typical of western operations. However, likely continued reliance on wet forages may keep herd size smaller than in the West. These operations probably will be a significant force by 2000. Those farms unable to make the transition are expected to exit at a relatively rapid pace.

Milk cow numbers are projected to decline about 1 percent annually. The expected 1-percent average annual growth in milk production would about match the rate of the early nineties but would trail the expansion of the eighties.

Milk Prices

Farm milk prices are expected to be under pressure during the next few years because of sizable surpluses of both milkfat and skim solids. Toward the end of the decade, milk prices are projected to begin increasing--but at a slower rate than inflation. For the whole period, milk prices are projected to increase about 1 percent per year.

One of the shock factors purposely assumed away in the baseline projections is periods of large commercial exports. The expected gap in domestic and international prices is small enough that relatively strong international markets probably will occasionally push international prices of butter or nonfat dry milk to domestic levels. Commercial exports will briefly be large and import access may not be filled. Maybe twice a decade, export markets are likely to generate temporarily higher commercial use and prices.

The 1995 Outlook

This year is shaping up as one of rapid growth in milk production, strong domestic demand, and a possibly significant export shock. A modest (possibly small) surplus and only a moderate price decline is in sight for the second year of the bST era.

Declines in milk cow numbers are expected to resume as 1995 progresses. Lower milk prices probably will begin to offset the stabilizing effects of recent structural adjustments. For the year, cow numbers are projected to average only fractionally below 1994.

Significantly more cows injected with bST and improved forage quality are expected to outweigh moderately unfavorable milk-feed price ratios and produce a relatively large gain in 1995 milk per cow. Output per cow is projected to rise about 3 percent, with the largest increases early in the year.

The 2-to 3-percent increase in milk production is expected to provide large supplies of milk for manufacturing. Unlike recent years, expansion in manufacturing supplies will not be largely limited to western areas. Along with expanded western cheese capacity, more Midwest milk should make it less difficult to expand cheese output.

Expected flat retail dairy prices and continued economic growth should boost domestic commercial use in 1995. Domestic sales are expected to increase 2 or 3 percent on either a milkfat or skim solids basis.

Strong demand from the former Soviet Union, Arab countries, and a few others combined with tight supplies and a weak U.S. dollar to boost international dairy prices this winter, particularly for milkfat. International butter prices moved above the U.S. support price and have lifted domestic prices. Commercial butter exports probably will be at least 50 million pounds and could go much higher if international prices hold. Nonfat dry milk exports under the DEIP will be larger during the first half of 1995. Large quantities covered by 1994 contracts are being filled this winter and business has been brisk under the new allocations. Recent contracts have been made at relatively small bonuses.

Government removals of skim solids under the price support program are projected to be slightly higher than in 1994. Much of the skim solids surplus will be removed under DEIP, although substantial spring and summer purchases remain a distinct possibility. The milkfat surplus will not be much larger than last year and could be very small. Commercial export demand potentially could absorb virtually all of the domestic excess of milkfat. Except for small quantities already targeted for specific uses, Government supplies of all dairy products are essentially exhausted.

Current prices of nonfat dry milk and cheese are not expected to withstand seasonal increases in milk supplies, and price decreases are likely by April-May. Cheese prices may not be down very long, however, because of expected strength in commercial use. Butter prices will be heavily influenced by international prices through midyear and are potentially volatile during the seasonally tight second half. Price increases above international levels probably will be limited because domestic users apparently have already put away substantial amounts of fat for summer.

Farmers are projected to receive 4 to 7 percent less for their 1995 milk, with the largest declines during the first half. However, the odds appear to be growing that stronger-than-expected commercial use may generate a smaller decrease.

STRUCTURAL DYNAMICS IN MILK PRODUCTION

Mark Stephenson
Senior Extension Associate, Cornell University

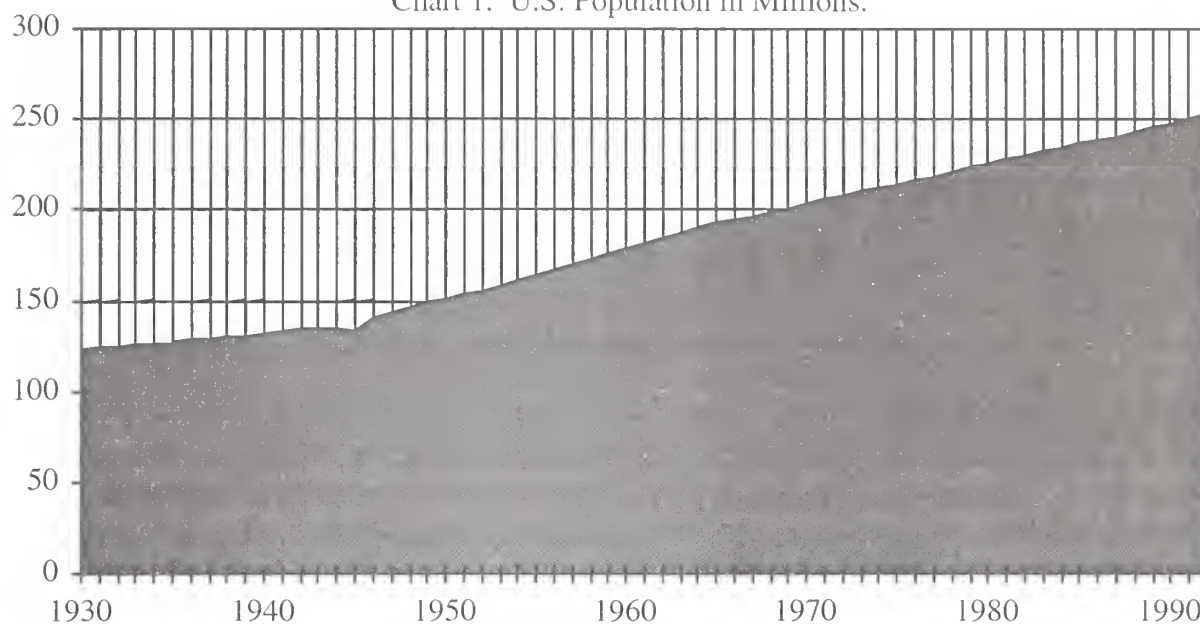
Low-cost milk production areas are considered to have more export opportunities than higher cost areas. These are the countries, regions, or sub-regions within a country that hold a particular “comparative advantage,” but differences in factor productivity, such as available technologies, or climate and soil types favorable to milk production, also play a role in comparative advantage. Certainly, when comparing regions within the U.S., factors available for producing milk differ. The dairy industry focuses much of its attention on issues of “competitive advantage,” which concentrates on quantity-type goals, such as maintaining market share through policy efforts. However, a number of factors that impact milk production fall under comparative advantage, including shifts in demand, historical production decisions, and regional resource endowments, such as land, soil type, and infrastructure. Technologies available to produce milk and transportation costs also fall under the comparative advantage structure and are examined in this paper.

Population Growth and Movement Through Time

Population growth is probably the single largest factor that changes demand patterns. Advertising, dietary changes, the economy, and a number of other factors influence demand, but the largest single element is population, including growth, shifts across demographic categories, and movement. Total population growth in the U.S. has been steady for decades, but growth has not been regionally uniform. Looking at population growth from 1930 through 1992 is informative. Prior to World War II, population growth was stable. During the War, when a share of the U. S. population moved overseas, the domestic population actually declined. When the veterans returned home, the babyboom generation was begun, causing a large increase in U.S. population, and the total growth hasn't slowed since. As Chart 1. shows, U.S. population growth since 1950 has shown a remarkably stable increase.

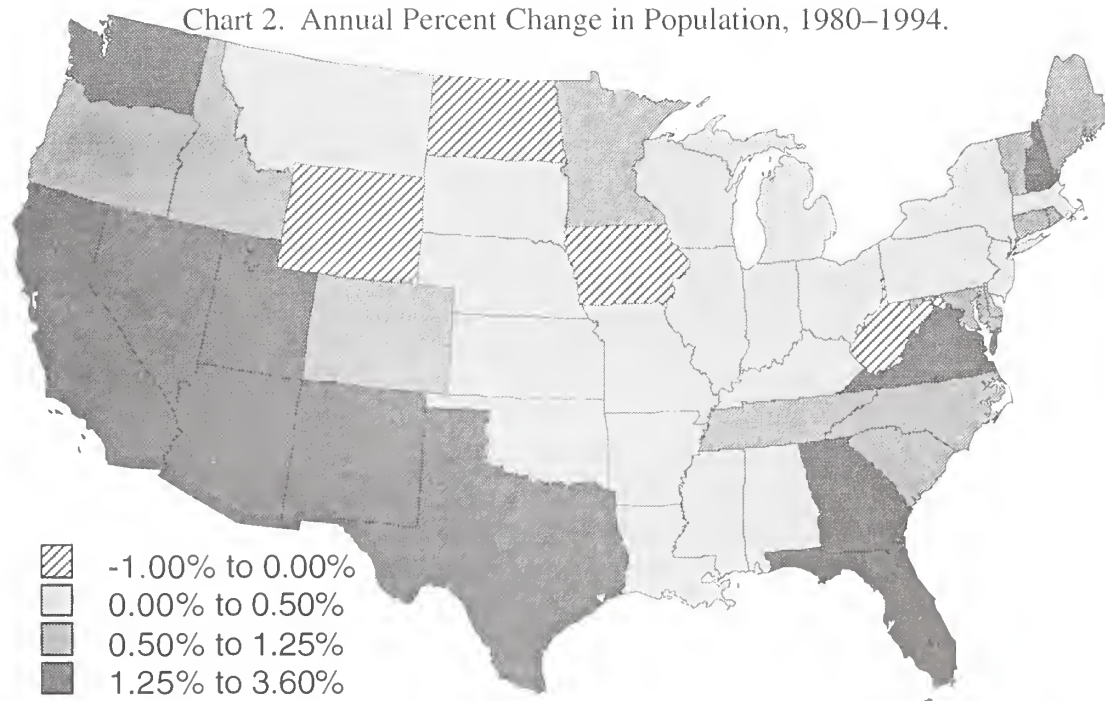
Population growth has not been occurring uniformly, however. Comparing 1930 and 1940 census data, just prior to World War II, New York, Texas, and California were the states that had the highest rate of population increase. In general, all of the states east of the Mississippi River were growing at a fairly rapid pace, while population in the Midwest was stable. Comparing 1980 and 1990 census data, of the three states showing the most population growth in the '30s—New York, California, and Texas—only California and Texas continued to show strong growth. A fair

Chart 1. U.S. Population in Millions.



amount of increase in the '80s occurred in the Southeast and throughout the West. Population growth generally occurred along the coasts, while the heartland experienced either slow growth to actual declines. The Northeast continues to be a densely populated region, as does the Southeast, Southwest, and West Coast, indicating a widely disbursed U.S. population. Chart 2 indicates recent regional growth patterns across the country.

Chart 2. Annual Percent Change in Population, 1980–1994.



Population movement over time can be measured by calculating the weighted centroid of population, (the geographically central point of density). Large movements of population are required to move the centroid any measurable distance. In 1930, the population centroid was near Decatur, Ill. By 1950, the centroid had shifted about 65 miles, almost directly west. Post World War II, however, a fairly dramatic shift occurred. Apparently, once home the veterans decided not to raise their families in the North; between 1950 and 1960, the centroid moved about 45 miles almost directly south. For a 10-year period, that is a fairly dramatic shift. In 1960, the population once again began moving west and slightly south. By 1990, the weighted centroid for U.S. population had moved nearly across the entire state of Missouri and is now located near Jefferson City. Population has been steadily moving to the west and south.

Historical Production Decisions Through Time

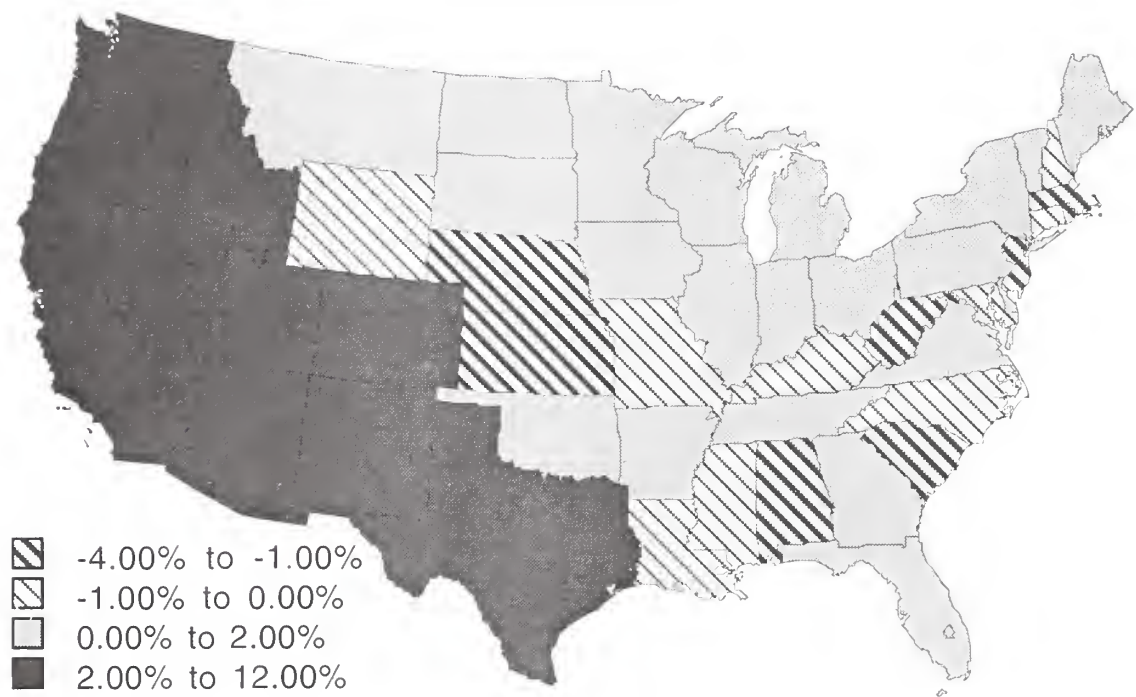
Population, and thereby local demand, is probably one of the largest factors of comparative advantage, but historical production decisions also have occurred in the context of regional shifts in production. For example, in the early 1800s, the population was mostly centered along the East Coast and, not surprisingly, so was milk production. The nation's dairy farms were located heavily along the Eastern Seaboard near Boston, New York, and Washington, D.C.. As the population grew and demand for milk became stronger, milk production began moving west. The railroad enabled the industry to move dairy products longer distances. Butter, the most highly desired milk component at the time, could move long distances, and even fluid milk moved more than 400 miles to the markets.

By the turn of the century, population along with milk production facilities had spread across the nation and the Upper Midwest had become a fairly substantial milk producing area. The Upper Midwest could produce milk at a relatively low cost, and new transportation technologies allowed the region to ship dairy products east where the population was concentrated. Another, and equally important, reason why the Upper Midwest was becoming an important dairy region is that dairy farming is perhaps the highest and best use of much of Upper Midwest's resources. Upper Midwest soils and climate cannot compete with Iowa or Indiana for corn and soybeans, but the region's land base is better suited to dairy production than the drier climate of the Great Plains.

Even though the Upper Midwest was rapidly becoming a large dairy area in the early 1900s, Wisconsin was not the center of production at that time. Dairy moved into Wisconsin quite rapidly. At the turn of the century, New York was still the largest milk producing state and Iowa was No. 2. Wisconsin—just trailing its southwestern neighbor at No. 3—was the nation's largest wheat growing state by a large margin. Wisconsin wheat growers, however, grew wheat upon wheat, which left the crop and soils susceptible to disease. W.D. Hoard, a journalist at the time, stood on his soap box exhorting the people to "give something back to the land." Hoard was successful, and dairy producers moved out of Iowa and other states in droves to relocate in Wisconsin. State-of-the-art, carbon-copy facilities were built throughout the state.

In the early 1930s when Wisconsin's dairy industry was on the rise, a pivotal technology was also being developed. In the 1920s and 30s, the 40-quart milk can had just been adopted as a standard. Prior to that, milk had been hauled in a variety of containers to processing plants. The first bulk handling of milk was occurring in California at the same time canned milk was becoming the new standard elsewhere. Perhaps, many of the structural changes that we are witnessing today, have occurred because of that single technology—the bulk tank, which required a large capital investment. Producers in the Upper Midwest having just invested in new facilities, were now faced with additional expenses for bulk tank units. To justify this large expenditure, farmers needed to add cows to facilities that were designed around a smaller scale of operation. Meanwhile, the new dairy farms in California could be built at a scale designed to accommodate bulk tank shipment of milk. The rapid population growth in the West gave California producers the incentive they needed not only to invest in the bulk tank, but also in new and different facilities. By this time, California was a large milk-producing state, but the Upper Midwest was still far dominant.

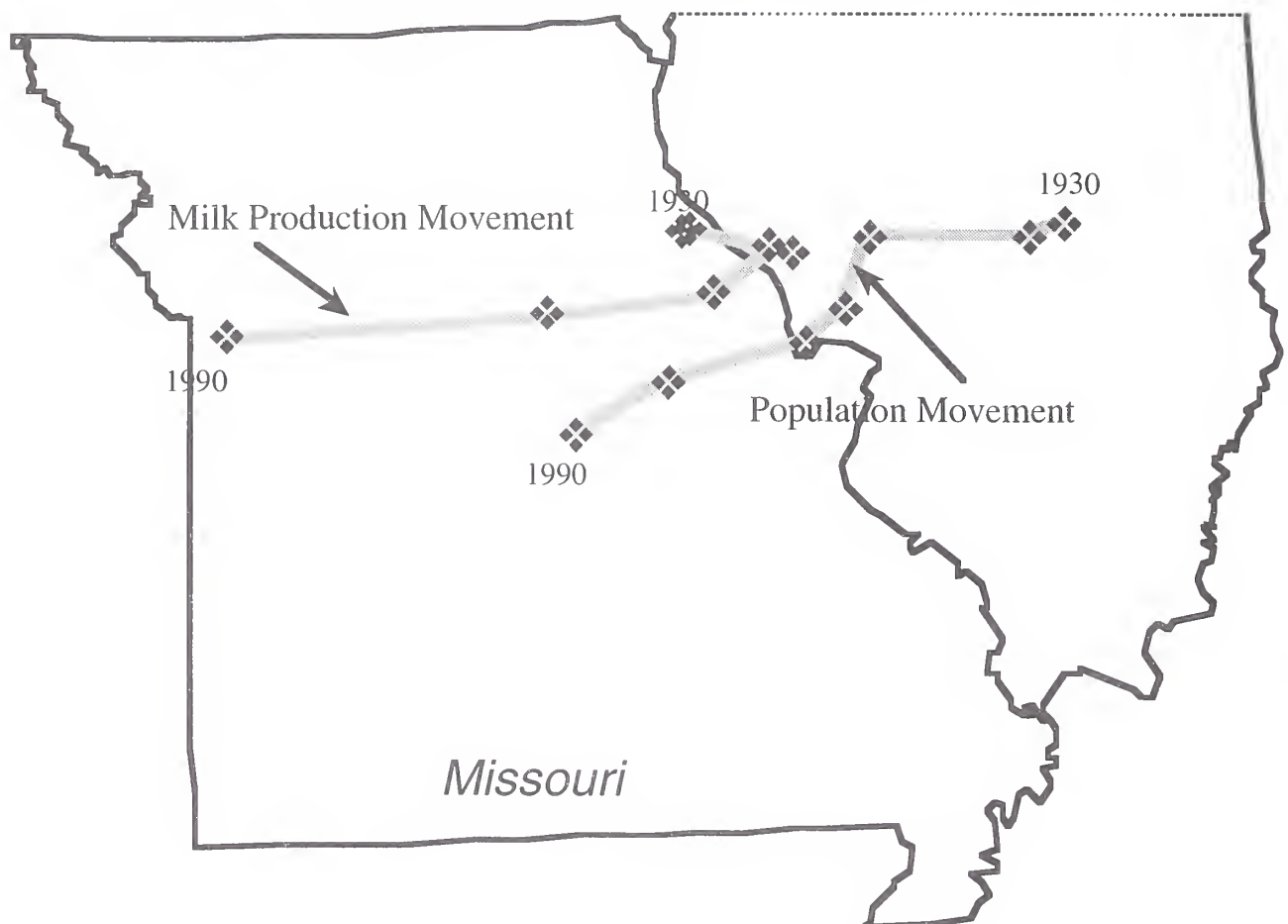
Chart 3. Annual Percent Change in Milk Production, 1980–1994.



Production Shifts Through Time

As with population, it's possible to calculate and plot the centroid of production and demonstrate how production has shifted through time. Between 1930 and 1940, the production centroid was fairly stable and situated about 35 miles southwest of Hannibal, Missouri. Between 1940 and 1950, however, the production centroid actually moved about 50 miles east into Illinois. The movement east had a lot to do with the rough times agriculture had experienced in the previous decade, or during the Dust Bowl years, when even western dairies headed back east. During the 1950s, production did an about face and began moving west once again. Production took another turn in the '60s and began moving southwest. The centroid in 1970 was located just north of St. Louis. In the past two decades, however, the production centroid has traveled almost directly west across the entire state of Missouri to the suburbs of Kansas City—a large movement for a 20-year time period.

Chart 4. Centroid Movements of Population and Milk Production, 1930–1990.



Looking at the movement of both centroids, population and production, plotted side by side shows remarkable similarities. The relationship between the two is quite appealing. Since 1950, the two centroids have paralleled each other fairly well, with production following population within 10 years. In general, the dairy industry is following the shift in population. So, what does that mean for the next 10 years? The magnitude of population movement has slowed, but also shifted. Currently, the movement is more to the south and not so rapidly west. Therefore, the expectation for the next decade is milk production will still move west and south, but not as rapidly as it has in the past two decades. This may be an indication that California's dairy industry is becoming mature.

Assuming uniform consumption of milk or dairy products across the country, one can also determine which states have more milk than they need on a per capita basis and which are shy of milk. In the 1930s, the entire West, Southwest, Great Plains, Southeast, and much of the Northeast were milk deficit. Even New York, a very large milk-producing state at the time, was milk deficit. The Upper Midwest had a large residual surplus of milk, between 200 million and 900 million pounds of annual surplus in Wisconsin alone. Many of the western states had moved from deficit to surplus by 1992, but not to the degree of surplus that still exists in the Upper Midwest (more than 20 billion pounds per year in Wisconsin). Even though California has surpassed Wisconsin in total production, California is not a large net exporter of dairy products. Likewise, Minnesota may have lost substantial market share over the past few decades, but the state is still a major exporter of dairy products. Chart 5 shows that New York and Pennsylvania have become modest exporters of dairy products, while the South, including Texas, remains a large importer of milk and dairy products.

Chart 5. Milk Surplus/Defecit States, 1992.

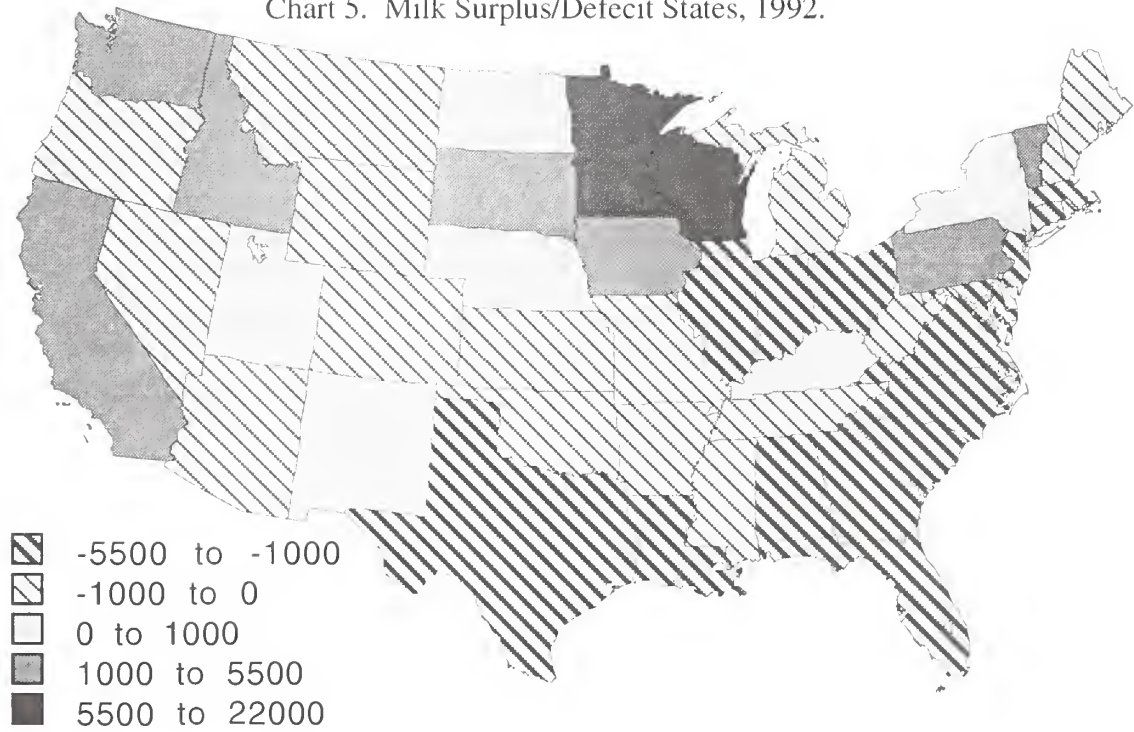
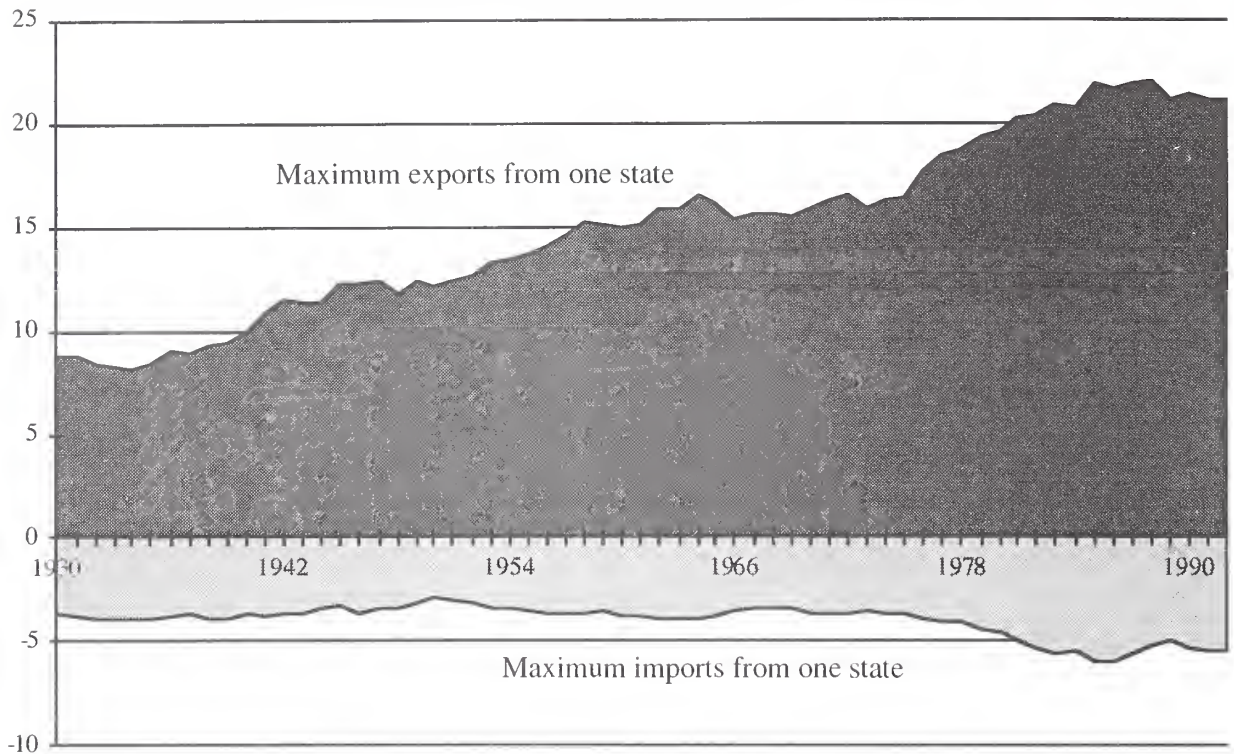


Chart 6. Maximum Volume of Imports/Exports from One State, Billions of Pounds.

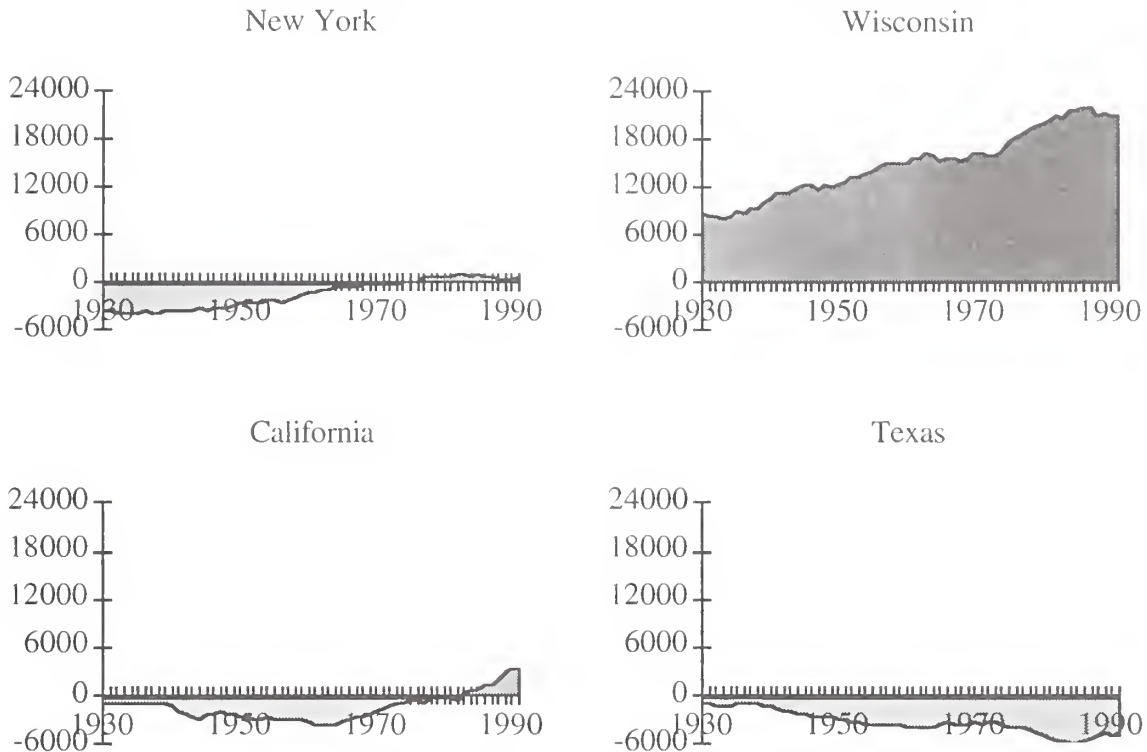


For the most part, the degree of surplus or deficit in any particular state has been magnified over time. Milk-deficit states have increased their deficit, while milk-surplus states have only added to their surplus. That magnification of surplus and deficit through time is likely the result of specialization caused by comparative advantages that have been realized. In other words, states that aren't efficient milk-producing states are importing more milk and dairy products, while states that are efficient in producing milk are exporting even more. New York is an interesting case in point. It wasn't until the mid-1970s after New York had gone through a major restructuring that the state went from being net deficit in milk to a modest exporter of dairy products. Wisconsin, a good size exporter in 1930, had become a very large exporter by 1992. Even Wisconsin's recent loss in total milk production is not an enormous volume when compared to the state's peak production year. Looking at California, the western state was milk deficit well into the 1980s and currently produces about 3 billion pounds of surplus milk per year—not even enough milk to supply the deficit in Texas.

Summary

Population movement accounts for much of the regional shifts in milk production that have occurred over the past several decades. Those production shifts are probably not the result of policy distortions. Quicker adoption of new technologies and relatively new facilities in the West

Chart 7. Milk Surplus/Deficit, Selected States—Millions of Pounds.



and Southwest make those regions more competitive in some sense than the traditional milk-producing region of the Upper Midwest. This is a structural issue, not a policy issue. As the facilities in the Upper Midwest become obsolete, they will be rebuilt. Compared to the West, the Upper Midwest has certain comparative advantages, such as climate and soils. The Upper Midwest, undoubtedly, will remain a large milk-producing region, and will continue to produce the bulk of the nation's residual milk over the next decade. At the same time, western production is not an aberration. The West will continue to increase market share.

How will changes in population over the next 20 years impact regional milk production? The Bureau of Census predicts that the western population movement will slow or actually halt and that by 2020 more of the population will have moved to the Southeast. The Bureau's projections may revolve around the theory that as the baby boomers age, they will retire to the warmer climate of the Southeast. If that proves true, are the implications for the dairy industry similar to those that occurred earlier? Probably not. U.S. population growth is expected to be steady, with no dramatic increases or decreases. However, the only demographic category expected to show growth in the next two decades is the 65-years-of-age-and-older category, as the baby boomers age. The remaining age groups, including the work horse of the economy (those 25-to 65-years-of-age) and the younger population (the real milk consumers), are declining at a fairly dramatic rate. The growth is in the aged population.

STRUCTURAL DYNAMICS IN MILK PRODUCTION: A WESTERN PERSPECTIVE

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Explaining milk production movements in the past is one thing.
Predicting where milk production will occur in the future is another!

Population growth and movement through time is clearly a good explanator of past movements in milk production. The major assumption is that demand shifts supply, and milk production will occur closer to population centers. Fallert, Weimar and Crawford (1993) came up with a concept of a "propensity to produce milk" index, which also adds to the explanation of past movements in milk production by explaining past changes in milk production relative to prices received. If we were to use this index to project potential changes in the future we would once again assume that milk production movements of the past may occur in the future.

While trends established in the past are obviously "pointers" for the future, there are clearly a number of other important factors that will influence the location of future milk production. One important factor driving milk production dynamics is profitability, (maximizing the difference between the price of milk and the cost of producing it) which in turn is driven by a number of other factors, as follows:

1. Ability to capture economies of size
2. Climate
3. Management style
4. Availability of inputs - especially high quality feed
5. Technology
6. Availability of market

None of these factors of course is more important than any other. You can't put your finger on any one of these and say "This is the most important factor". There is clearly a dynamic interaction between them, and profitability will be determined by a combination of all of the factors. Furthermore, the interaction between them, and their combination will be different for each defined region of the U.S.

For example, the ability to capture economies of size will be influenced by almost all of the other factors. Climate can be modified by technology, and will also be important in determining the availability of high quality feeds. Climate also has an important influence on the health of the herd and on the applicability of certain technologies, and so on.

Management style is also an interesting factor. There appear to be two distinctly different types of management style associated with milk

production. One is the traditional maximization of milk production per cow, currently epitomized by the large, dry lot California-style dairying which is currently causing expansion in the Southwest. The other is to maximize milk production per acre - a style that is characterized by rotational grazing, or New Zealand style "voisin" systems.

Management style is also influenced by attitudes toward farming. It is one thing to manage a large, dry lot 1500 cow operation in a warm, dry climate, and quite another to maximize profits on a 50 cow mixed farming enterprise in a cooler and more humid climate.

There are also some uncertainties in this process. Apart from the seasonal variations in climate and the usual risk and uncertainty associated with farming in general, changes in policy also have an important impact on the profitability, and therefore the location, of dairying. Future changes in the price support program, federal milk marketing orders, environmental rules and regulations, and food safety/quality standards will impact the ability of some producers to remain in dairying.

So where will milk be produced in the future?? The following are three examples of potential change associated with the factors of profitability outlined previously.

1. Continued Expansion in the Southwest.

According to Fallert, Weimar and Crawford (1993), the top four states with a propensity to produce milk in the last 15 - 20 years are New Mexico, Arizona, Nevada, and California. Given the factors that have contributed to the enormous expansion that has occurred in these regions in the past (large herds, hot, dry climate, plentiful high quality feed, and appropriate technologies), one would expect to see some continued expansion in the next 10 years. The one limiting factor may well be environmental regulations, and this would most likely be more important for California than for the other 3 states.

A study to examine the feasibility of re-establishing a dairy industry in the Imperial and Palo Verde Valleys is currently being carried out at the University of California. Preliminary results show that this area of California's low desert, which is a major alfalfa growing area, may well be a potential future supplier of milk not only to the Los Angeles/San Diego basin, but also to Arizona and Northern Mexico.

2. Expansion into the Western Plains.

While Nebraska and Kansas do not seem like states where dairy operations would abound, and are very low on the list of states with a propensity to produce milk, there do appear to be some factors that would favor expansion in this region. Plentiful and relatively cheap land is available. Flexibility in management styles is a possibility since both intensive and extensive systems are possible. The climate is cooler than the Southwest and the market for milk is some distance away. But there has been interest in these areas in establishing large California-style operations to take advantage of the natural resources of the region.

3. Changing Management Styles in the Midwest and Northeast.

There is increasing evidence that management style has become the focus of structural change in the Midwest and Northeast regions. Some are choosing the modified California-style larger herd/purchased feed model to maximize milk production per cow. Others appear to be interested in the more extensive voisin style of rotational grazing to maximize milk production per acre. But one thing is clear, milk production will continue in these regions. The biggest factor that will ensure that milk production will continue in the Midwest and Northeast for some time to come is the infrastructure that exists.

There are probably plenty of other examples that could be cited where potential future milk production expansion could occur, and each one justified by the factors outlined above. However without quantifying the factors that do drive change, it is impossible to detect those large, dramatic changes that may take place in the future. While it certainly is fun speculating on where those changes could take place, I really don't have any more idea than you do!

PEERING INTO THE FOG AT ONCOMING DAIRY POLICY

**Bruce L. Gardner
University of Maryland**

This discussion of future dairy policy begins, following the time-honored forecaster's practice, by gazing intently into the rear-view mirror. The striking aspect of dairy policy is how unsettled it has been. Dairy interests had a remarkably successful time in the 1970s. The support price to be achieved by CCC purchases of dairy products doubled between 1975 and 1980, peaking briefly at \$13.49 (national average milkfat basis) in October 1981. Production costs were also rising rapidly at this time, and the support price rose only from about 79 to 81 percent of parity (ratio of milk support price to index of farm input costs). Although some in the industry argued that excess supplies would not become a problem until the support price reached 85 percent of parity, this soon proved to be untrue. CCC dairy product removals soared in 1980/81 and overproduction has been a recurrent problem for the dairy industry ever since (figure 1).

The cost of the dairy program, with CCC net expenditures reaching \$2.6 billion in the 1982/83 marketing year, became an obstacle that has stymied any further enriching of the policy pot for dairy. Instead, the focus switched to supply management, where it has remained. In the 1980s we had output reduction agreements and dairy herd buyouts, but these only temporarily stopped production growth. The support price was substantially reduced, by 23 percent between 1984 and 1990 to the \$10.10 level where it remains today. Assessments for federal budget

reduction purposes began in 1991, and are 11¼ cents per pound; but they have a supply management element in that assessments are refunded if a producer did not increase milk marketings over the preceding year. In 1993 refunds were \$80 million, and this required an offsetting 8.0 cent per pound assessment in May-December, 1994. But even with the additional assessment the penalty for expanding output is less than 2 percent of the U.S. average price of milk.

More important to supply management, both economically and psychologically, is the Dairy Export Incentive Program (DEIP). This program spent \$135 million in FY 1993, which accounts for roughly half of the \$253 million net CCC outlays on dairy. Most of the product exported was nonfat dry milk. Much more CCC-owned butter has been exported under "section 416" authority. These exports have taken on the lion's share of the surplus disposal necessary to maintain the dairy support program while minimizing federal budgeting outlays on dairy.

Why should anything change in dairy policy in 1995? Policy will change only if there are changes in the underlying forces. These includes: (1) the economic situation in the dairy industry, (2) broader economic changes, (3) changes in the political clout of interested parties, (4) changes in the broader policy picture, (5) unfinished business from prior dairy policy debate. I will discuss each of these factors briefly.

1. The dairy economy has been stronger than it was forecast to be when the Food, Agriculture, Conservation and Trade (FACT) Act of 1990 was enacted. In 1990, the big decline in milk prices in the previous fall had many people worried, but the U.S. average price of manufacturing milk has averaged about \$1.50 above the support level since 1990. This suggests less industry pressure for government assistance in 1995.

2. The economy is showing a lot of strength, with low inflation, and low food prices. This can be important because consumers appear particularly sensitive to milk prices. Their stability indicates little pressure from consumer interests for policy changes. It is interesting that neither the cases of salmonella infection from ice cream last fall, nor the ongoing controversy about BST in milk appear to have had the kind of negative influence on consumer perceptions and demand that such cases sometimes generate.

3. The political standing of various interests in dairy do not appear to have changed significantly. But regional differences among producer groups seem to have tarnished overall dairy industry effectiveness.

4. Overall politics has seen a substantial change, with budget-cutting pressures and general mistrust of government hitting new highs. But, since federal spending on the dairy program has already been reduced from \$2 to 3 billion in the mid-1980s to \$200-300 million now, the pressure for further cuts has to be less. Even if federal outlays were reduced to zero it would only cost producers \$.15-.20 per hundredweight — roughly a 1½ percent price cut.

5. Significant items of dairy business left unchanged in the 1990 Act include:

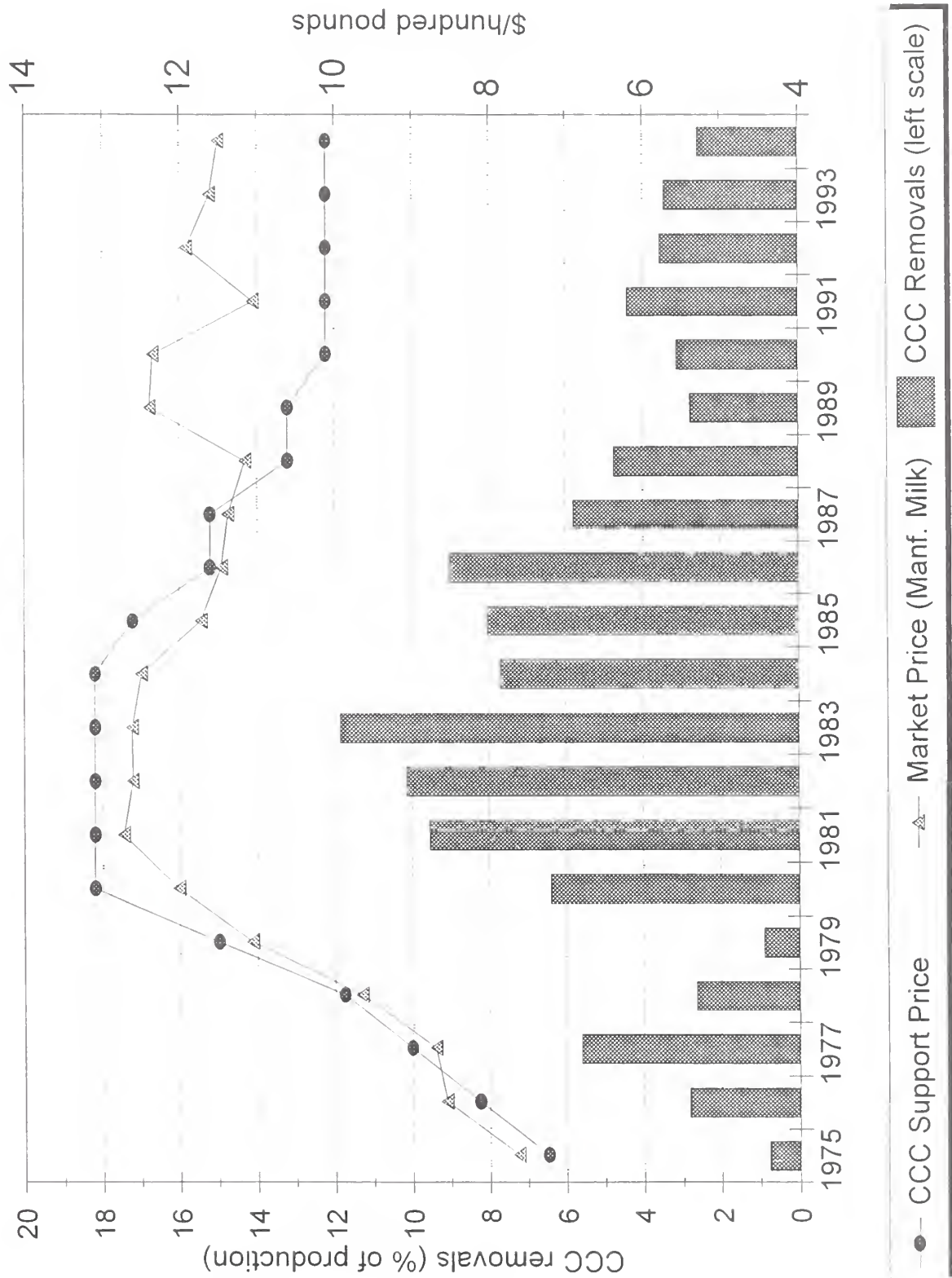
- supply management
- regional price support issues, notably the California make allowance
- marketing order reform
- the M-W price as a policy instrument

On supply management, the 1990 Act required USDA to study options and report to Congress. The study recommended essentially nothing, and that is what Congress did. Much political churning led nowhere, due principally to regional disagreements — why should areas

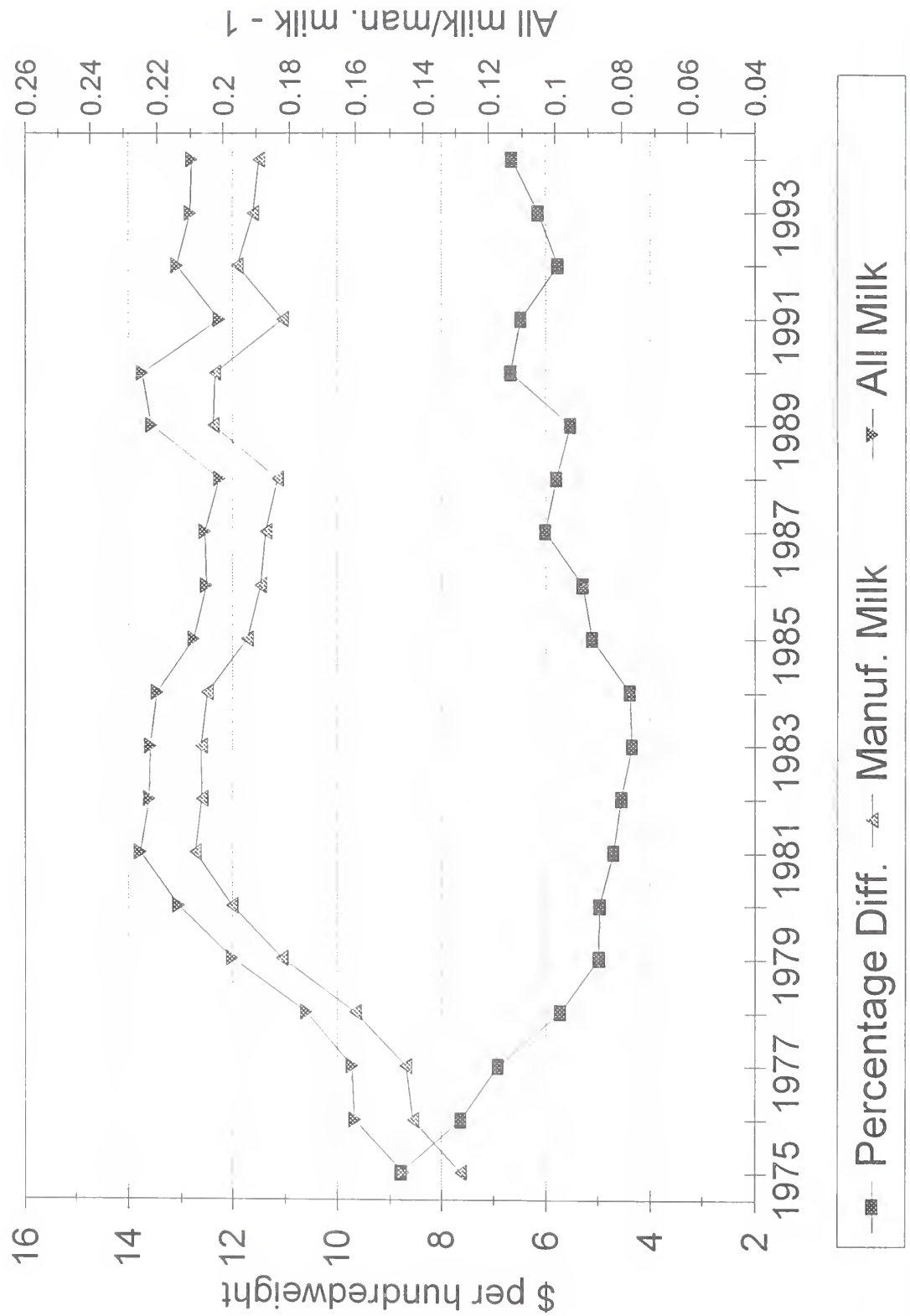
where it is profitable to expand want to cut production? The industry's appreciation for DEIP has led to a switch in focus to export subsidies as a means of supply management. However, this approach will run afoul of GATT disciplines in 1995, and it remains to be seen how export subsidies can be worked out. Some export promotion is not disciplined under GATT, and some cross-commodity substitution of export funds is permitted, but the consequences for dairy remain unclear, to me anyway.

On regional issues, the make allowance is still unresolved, in the courts, but the idea of regional price policies for milk has picked up steam. New England is leading the parade, and the National Governor's Conference in early February, 1995, endorsed a stronger regional pricing element in marketing orders. On marketing orders, USDA studied the issue intensively in 1991-92, but in the end did little. Upper Midwest voices continue arguing, correctly in my view, that the marketing order system still works against them by keeping their prices lower relative to the rest of the country. Indeed, on an overall U.S. basis the all-milk price relative to manufacturing price is slightly rising, indicating increased price discrimination (Figure 2). Nonetheless, I would say policy change is unlikely.

Figure 1. Milk Prices and CCC Removals



**Figure 2. Percentage Difference
Between Manuf. and All-Milk Prices**



WHAT'S IN STORE FOR DAIRY POLICY AND MARKETING ORDERS?

Edward T. Coughlin

Director of Regulatory Affairs, National Milk Producers Federation

Since 1995 is a Farm Bill year, the question "What's in Store for Dairy Policy and Marketing Orders" is generating considerable discussion throughout the dairy industry.

In the Senate, Agriculture Committee Chairman Richard Lugar has questioned whether commodity programs and marketing orders should be continued. On the House side, Livestock, Dairy and Poultry Subcommittee Chairman Steve Gunderson, is on record as wanting to redesign current dairy programs.

The organization I represent, National Milk Producers Federation, is anxious to work with the Congress and others to develop politically achievable policies that benefit the entire industry.

The dairy price support program has been a cornerstone of U.S. public policy toward the dairy industry for 45 years. The current dairy price support provisions are authorized through or beyond 1995. The Omnibus Budget Reconciliation Act of 1993 extended the \$10.10 minimum price support level and the price reduction to producers when CCC purchases exceed 7 billion pounds through 1996. The same act authorized the budget reconciliation price reduction at \$.10 per cwt. for 1996 and 1997.

The Uruguay Round Agreements Act authorized the Dairy Export Incentive Program (DEIP) through 2001. The Commodity Credit Corporation (CCC) dairy purchase, donation and sales programs are permanently authorized under the Agricultural Act of 1949.

The annual net cost of the dairy price program was reduced from \$2.5 billion in fiscal year 1983 to \$158 million in fiscal year 1994. Without doubt the 1995 Farm Bill provision will be budget driven. Eliminating the dairy price support program is a possibility. At the very least, the program will have to adjust to further cuts in federal funding.

Under the Uruguay Round GATT accord the U.S. must reduce the product volumes and the monetary outlays used to export dairy products under the DEIP and the CCC export sales programs. These commitments, which become effective July 1, 1995, require the U.S. to reduce subsidized dairy product exports in even annual increments from 2.82 billion pounds

milk equivalent and \$185.6 million in 1995 to 1.53 billion pounds and \$116.6 million in 2000.

The CCC dairy purchase program and the \$10.10 minimum price support level are considered "domestic support" measures under the GATT agreement. The U.S. has committed to reduce these and many other domestic agricultural supports, but only on an aggregate basis for all commodities and programs. Furthermore, the required reductions are measured from a base in the mid-to-late 1980's, when U.S. farm supports were considerably higher than they are now. The U.S. has therefore already met its total domestic support reduction requirements and will not have to change the CCC dairy purchase program nor the \$10.10 per cwt. support price for milk as a result of the Uruguay Round agreement.

Under the trade agreement, producer assessments are treated as reductions in domestic support to farmers. Reducing or removing a producer price reduction such as the budget reconciliation milk price reduction, would count as increasing domestic support. However, the U.S. could totally eliminate all current dairy producer price reductions and easily stay within its total domestic support reduction requirement under the trade agreement.

1995 FARM BILL ENVIRONMENT

LEGISLATIVE OUTLOOK

- Federal funding to continue a dairy price support program will be reduced.
- Federal dairy price support program funding will end in five years or less.
- Federal milk orders will be eliminated unless "reforms" are made.

MARKETS

Current

- The U.S. milk supply is increasing faster than domestic demand.
- Dairy product imports are limited.
- Dairy exports due to DEIP subsidies are over 2.5 billion pounds a year.
- Price support removals are moderate and government stocks are low.
- Milk prices have remained above the support price level for four years.

Outlook

- The U.S. milk supply will continue to increase faster than domestic demand.
- The GATT will reduce U.S. barriers to dairy imports.
- The GATT will increase export opportunities by reducing import barriers that countries impose.
- U.S. subsidies reductions will cut DEIP exports almost in half over five years.

The GATT will strengthen international market prices and enhance export opportunities by requiring other countries to their reduce export subsidies.

FUTURE POLICY

I believe that we should try to improve dairy producer income by developing new markets for U.S. dairy products through initiatives to capture expanded export opportunities available under the Uruguay Round GATT accord. The Uruguay Round GATT accord opens the door, albeit just a crack at first, to new markets for U.S. dairy products. The time to capture these new markets is now, not five years down the road when others have built customer relationships. The 1995 Farm Bill should be structured to help the U.S. dairy industry capture international markets.

I think the dairy price support program and the 11.25 cent budget reconciliation milk price reduction levied on dairy producers to partially fund price support activities should be eliminated. Eliminating the milk price reduction will put money in every dairy producers' pocket, while eliminating the price support program will permit unrestricted access to export markets. One need not look any further than the quick pace of 1995 DEIP sales to get a peek at what unrestricted access to international markets might mean in the way of additional export sales.

The U.S. dairy industry is in a position to compete for unsubsidized international markets. International dairy market prices have moved up close to the U.S. support price for butter and nonfat dry milk. Based on international dairy market prices reported in the USDA Dairy Market News last week (Feb. 13 - 17, 1995), returns to butter-nonfat dry milk plants were close to or above the returns realized using CCC purchase prices.

FEDERAL ORDERS

Turning to federal orders, I think the dairy industry has a continuing need for orders to maintain the statutory authority necessary for marketwide pooling. The federal order issues are very contentious. At stake are issues that involve dividing the pie i.e., who gets less money and who gets more money.

For several years federal orders have been criticized as being inequitable to dairy producers in the upper midwest. One perceived inequity is the Class I price structure. Class I differentials increase as the distance from their lowest in the upper midwest increases (\$1.20 Minneapolis & \$1.40 Chicago vs. \$3.14 New York & \$4.18 Miami). A question we hear is: *Why is the Class I differential in Chicago \$1.74 less than New York when both markets have an adequate milk supply?*

The current differentials were among several provisions in a legislative package proposed by

NMPF that was enacted in the 1985 Farm Bill. A proposal to change the differentials was considered at a lengthy hearing held by USDA in 1990. USDA decided not to make any changes in the federal order Class I differentials based on that hearing. The NMPF members were split at the hearing and remain divided today over federal order "reforms".

Another criticism of orders involves the federal order market structure. On January 1, 1995 there were 38 federal orders. The orders with the highest Class I utilization are in the southeastern U.S. while upper midwest orders have low Class I utilization. The average federal order blend price to producers in 1993 ranged from \$11.91 in the Upper Midwest order to \$15.28 in the Southeastern Florida order.

"REFORMS" THAT WILL BE DISCUSSED

NATIONAL POOLING

Under a national pooling scenario with no change in existing Class prices or other order provisions, the blend price to producers would have averaged \$12.89 in 1993. Compared to the actual blend price in each order, a \$12.89 blend price would have been lower in 24 orders and higher in 13 orders (See table below).

<u>1993 Blend Price Range</u>	<u>No. Orders</u>
< \$12.00	1
\$12.00 - \$12.89	12
\$12.90 - \$13.24	7
\$13.25 - \$13.99	9
\$14.00 - \$14.99	7
> \$15.00	1

MULTIPLE BASING POINT PRICING

Under a multiple basing point pricing plan the Class I differential would be fixed at the same level under each order that is adequately supplied with milk for fluid use. An order with an annual average Class I utilization less than 60 percent is generally considered to have an adequate fluid milk supply. Except for 12 southeast orders and a few others, all federal orders have a Class I utilization below 60 percent.

The Upper Midwest has the lowest Class I differential (\$1.20) among all federal order. The highest Class I differential among orders with less than 60 percent Class I utilization is \$3.24 in New England.

MERGE EXISTING ORDERS INTO ABOUT FIVE REGIONAL ORDERS

LEGISLATE A FLOOR UNDER THE CLASS I PRICE

The 1995 Farm Bill with a new party controlling Congress, with deep budgets cuts that will gut programs and with the GATT accord being implemented provides an opportunity to restructure existing programs. It's going to be tough to convince some in the industry to abandon a price support program that has done a good job in providing a safety net on milk prices. However, I'm convinced that the restructuring can benefit the dairy industry.

U.S. Horticulture's Long Run Economic Outlook: USDA View

by

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Abstract: Production of fruits, nuts, vegetables, potatoes, dry beans, and greenhouse/nursery crops is projected to increase to \$46 billion by 2005 from the current \$31 billion. Consumption of many fruits and vegetables is increasing at slower rates than a decade earlier, and the slowdown is forcing U.S. producers to develop markets in Asia and Latin America. Although U.S. fruit and vegetable production is rising, imports have risen recently and increased competition in the domestic market. However, demographic changes in the U.S. population suggest a possible upturn in demand, contingent on a strong macroeconomy.

Keywords: Horticulture, fruits, vegetables, greenhouse and nursery, economics, outlook.

Horticulture Industry Set to Grow 3-4 Percent Annually

The U.S. horticulture industry, including fruits, nuts, vegetables, potatoes, dry beans, and greenhouse and nursery crops is projected to produce \$39 billion of output in 2000 and \$46 billion in 2005. The projections follow a trend of 3-4 percent annual average growth from the \$31 billion value of production in 1994. Output is projected to increase faster than U.S. population, exports

are projected to increase faster than imports, and price is projected to increase at the long run rate of 1 to 2 percent per year. Projected efficiencies in production and marketing technology moderate increases in costs.

Projections are based on a combination of trends and expected changes in fundamental factors affecting supply and demand. My purpose is to discuss the trends and factors affecting the U.S. horticulture industry over the next 10 years.

U.S. horticultural industry: Value of production, imports, and exports, 1992-1995, 2000, 2005

Item	Unit	1992	1993	1994	1995	2000	2005	Ann. Growth 1994-2005
Production								
Fruits, nuts	\$Billion	9.8	10.0	9.7	10-11	12.5	14.9	3.9%
Vegetables	\$Billion	11.2	12.2	11.8	11-12	14.3	16.3	3.0%
Green crops	\$Billion	9.1	9.3	9.5	9.5-9.8	12.0	14.5	3.8%
Total	\$Billion	30.2	31.5	31.0	30.5-32.8	38.7	45.7	3.5%
Imports								
Fruits, nuts	\$Billion	4.7	4.4	4.6	4.6-5.2	5.8	6.8	3.5%
Vegetables	\$Billion	1.8	2.1	2.3	2.3-2.6	3.1	3.9	4.7%
Green crops	\$Billion	0.6	0.6	0.6	0.6-0.7	0.8	0.9	3.2%
Total	\$Billion	7.1	7.1	7.6	7.5-8.5	9.6	11.6	3.9%
Exports								
Fruits, nuts	\$Billion	3.8	3.9	4.3	4.1-4.8	5.4	6.7	4.0%
Vegetables	\$Billion	2.2	2.5	2.6	2.4-2.9	3.6	4.7	5.4%
Green crops	\$Billion	0.2	0.2	0.2	0.2-0.3	0.3	0.4	3.8%
Total	\$Billion	6.2	6.5	7.2	6.7-8.0	9.3	11.8	4.5%

Produce Consumption Flattens in the 1990's

U.S. consumers are apparently paying less heed to health professionals' advice to increase consumption of fresh fruits and vegetables. The consumption trend has flattened in the 1990's after rising most of the 1980's, putting a chill on expectations that U.S. consumers would double their consumption of fruits and vegetables by 2000.

In 1994, consumption of fresh fruits, vegetables, and potatoes totaled 255 pounds per person--about the same as in 1988. However, in the 1980's, consumption increased nearly 2 percent per year, on average. The current flat trend for produce is the net result of declining consumption of vegetables offset by a rise in bananas and fresh citrus. Fresh potato consumption remains flat.

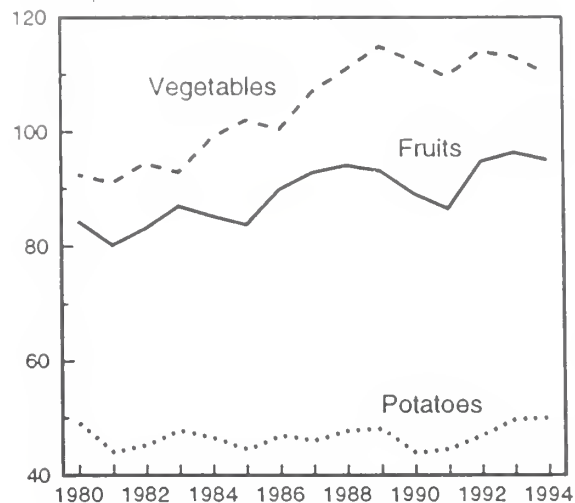
Vegetable growers will likely react to the low prices received during most of 1994 by cutting back on production in 1995. As a result without increased imports, lower fresh vegetable supplies will boost prices in 1995, and keep consumption flat. Fruit growers have an incentive to sell less if prices remain low, but they have less flexibility than vegetable growers to cut costs by cutting back on output. For example, there is potential to produce more citrus, as more trees come into full bearing in Florida and Texas.

The fruit and vegetable industry has responded to the flat trend in consumer demand for produce, in part, by looking to foreign markets for increased opportunities. Exports of fresh fruits and vegetables have increased from 7.5 billion pounds in 1990 to over 10 billion pounds in 1994, expanding 7 percent per year. The value of fresh fruit and vegetable exports in 1994 totaled \$2.9 billion, up from \$2.2 billion in 1990.

However, sales to Canada and Western Europe have stagnated since 1990, owed in part to their weakened currencies relative to the U.S. dollar. During 1990-94, the value of U.S. produce exports to these countries increased less than 1 percent per year, while exports to Latin America and Asia increased about 15 percent annually. The share of U.S. produce exports sold to Canada and Western Europe decreased from 61 percent in 1990 to 47 percent in 1994. The lower growth in these markets was made up by gains in Asia, going from 33 percent in 1990 to 41 percent in 1994, and in Latin America, going from 5 percent to 11 percent. Mexico accounts for all of the increase in Latin America's share.

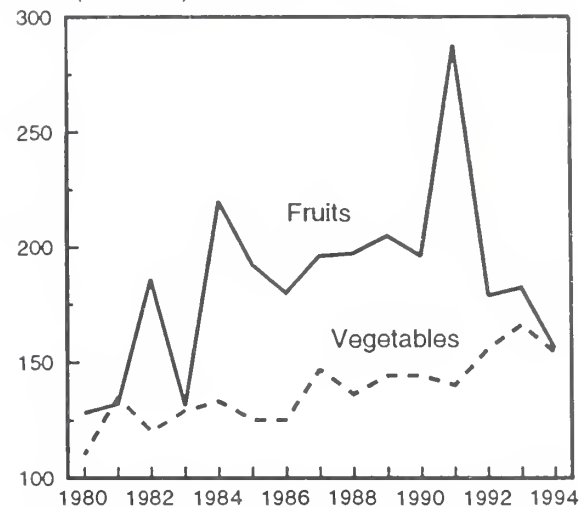
Produce Consumption

Pounds/person



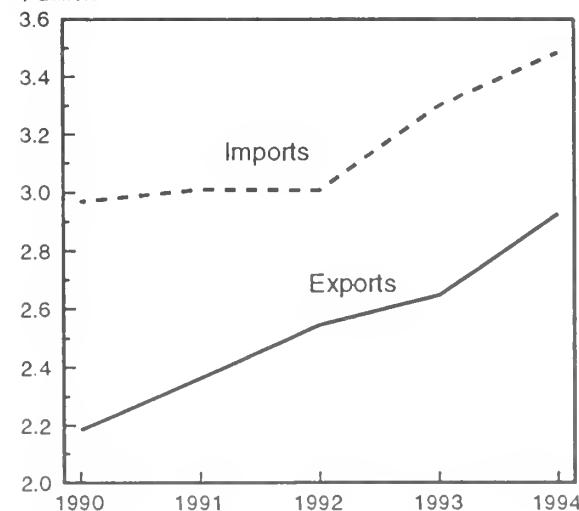
Produce Farm Prices

Index (1977=100)



U.S. Fresh Produce Trade

\$ Billion



Although a weakened peso is likely to slow the growth in exports to Mexico in the short term, Latin America and Asia are likely to continue as the most rapidly developing markets for U.S. produce. The NAFTA and GATT trade agreements helped the U.S. produce industry by lowering tariffs, reducing quotas, and facilitating resolution of phytosanitary disputes. But even before NAFTA, U.S. exports to Mexico were on the rise. Recently Japan accepted its first load of Washington State apples, and U.S. exporters anxiously await the verdict of consumer acceptance. Japan's economy is emerging from recession, and higher consumer incomes should boost demand for U.S. produce exports.

Produce imports followed the pace of U.S. domestic consumption in the early 1990's. The recent upturn is due to increases in a wide variety of items, from avocados to berries, mangoes, and melons. Imports of several high-volume items, such as tomatoes and apples, have remained flat in the 1990's.

While Latin America remains the major source of U.S. imported produce with an 85-percent share of the total, the position of South America has eroded in the last 5 years. The share of produce import value coming from South America declined from 28 percent in 1990 to 24 percent in 1994, while Mexico's share remained at 38 percent. Chilean grape and apple imports have declined from \$270 million in 1990 to about \$215 million in 1994. Recent reports from Chile suggest that fruit exports will continue level or decline due to aging orchards and vineyards.

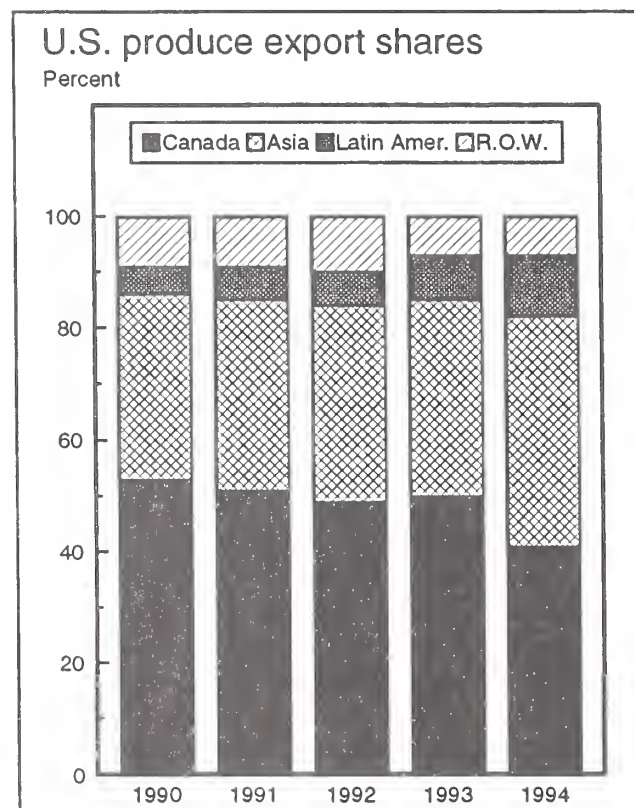
The trend toward importing from countries with relatively weaker currency partly explains the increased share of U.S. imports coming from Canada and Western Europe. Together, these sources account for 11 percent of annual U.S. fresh fruit and vegetable imports, up from 9 percent in 1990.

Popular Items Keep Processed Market Strong

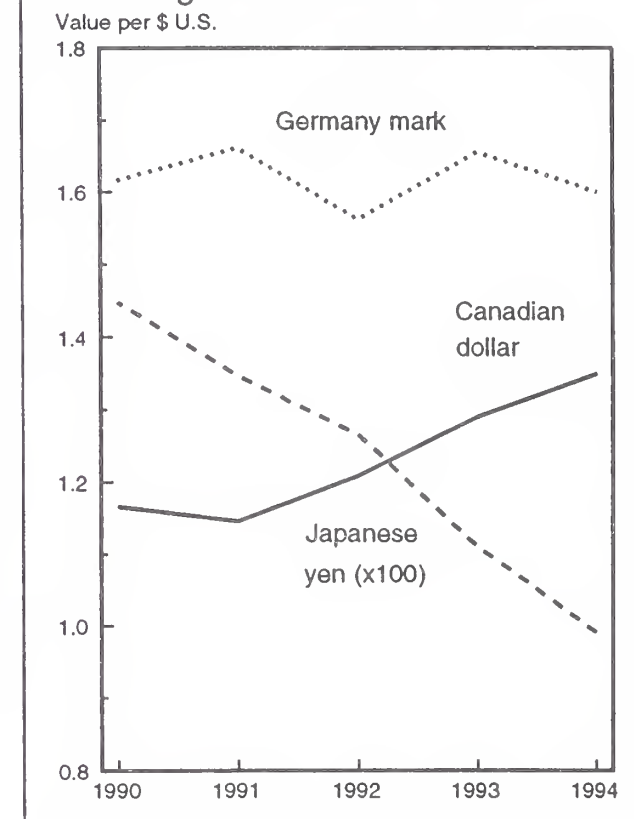
Consumption for processed fruits and vegetables, primarily orange juice, frozen potatoes, and tomatoes, continues to increase in the 1990's. This reflects the continued demand for convenience foods both domestically and abroad. And, where the domestic trend has become flat, processors are looking for exports to boost sales.

U.S. per capita consumption of frozen vegetables is projected to increase about 1 to 2 percent per year during 1995 to 2005, while canned vegetable consumption is

Export Shares Change With U.S. Dollar's Value



Exchange value of U.S. dollar



projected to remain flat. Orange juice consumption is projected to increase about 0.5 percent per year to 2005.

Processed fruit and vegetable exports (including canned, frozen, and dried products, juices, wines, and nuts) increased from 45 percent of total fruit and vegetable exports in 1990 to 50 percent in 1994. About 37 percent of U.S. exported processed fruits and vegetables goes to Canada and Latin America, 37 percent to Asia, and 20 percent to Western Europe. Exports to Asia have increased faster than exports to other regions in recent years, and U.S. firms are anticipating continued growth especially in Japan.

U.S. imports of processed fruits and vegetables will continue to be largely affected by changes in the domestic supply situation and the relative value of exporter currencies. For example, U.S. imports of frozen concentrated orange juice decreased from 1990 to 1992, as Florida growers recovered from the devastating freezes of the 1980's. However, 1994 FCOJ imports were up about 10 percent.

Now that Florida's orange production is set to increase with maturing trees in place, imports from Brazil face a highly competitive U.S. market. On the other hand, a weaker Latin American currency will force U.S. processors to improve efficiency to be price competitive with the cheaper imports. Processed tomato imports from Western Europe, which increased in 1994, are also likely to face stiff competition in the U.S. market if the U.S. continues to increase output at the 1990's rate of 2-3 percent annually.

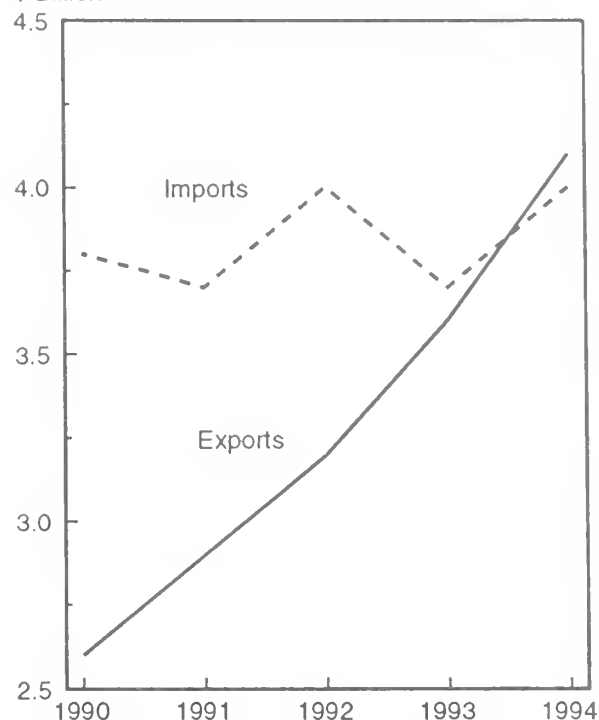
Processed fruit and vegetable exports have contributed to the growth in high-value product (HVP) exports, which claim a growing share of total U.S. agricultural exports. HVP exports (including meats, snack foods, etc.) have risen 8 percent annually during the past 5 years, while bulk commodity exports have declined 4 percent. HVP exports will likely claim a 42 percent share of U.S. exports in 1995, up from 37 percent in 1992, and prospects are good for a continuing increase in share of U.S. export trade.

Long Run Factors in the Outlook for U.S. Horticulture

Performance of the U.S. and foreign economies is an important factor affecting demand for horticultural products. The period of fastest rise in produce consumption--the late 1980's--followed several years of rapid growth in the domestic economy, and the recent slowdown follows the 1991 recession.

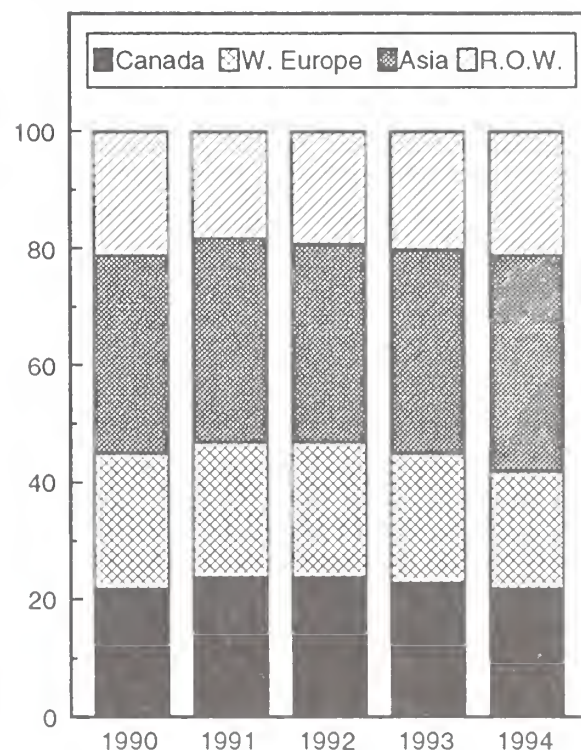
U.S. Processed Fruit and Vegetable Trade

\$ Billion



U.S. Processed Fruit and Vegetable Exports

Percent



If the U.S. economy follows a long run projected annual growth of 2-3 percent, demand is likely to remain steady over the next 10 years. Western Europe and Japan are emerging from recent recessions, and near-term export demand is likely to remain strong.

The U.S. population is expected to grow at 0.9 percent per year to the year 2000. But perhaps as important is the expected change in demographics. The age distribution of U.S. consumers is projected to skew toward older age groups. The "baby boomers" are moving through middle age now, and healthy eating choices are more important to older populations.

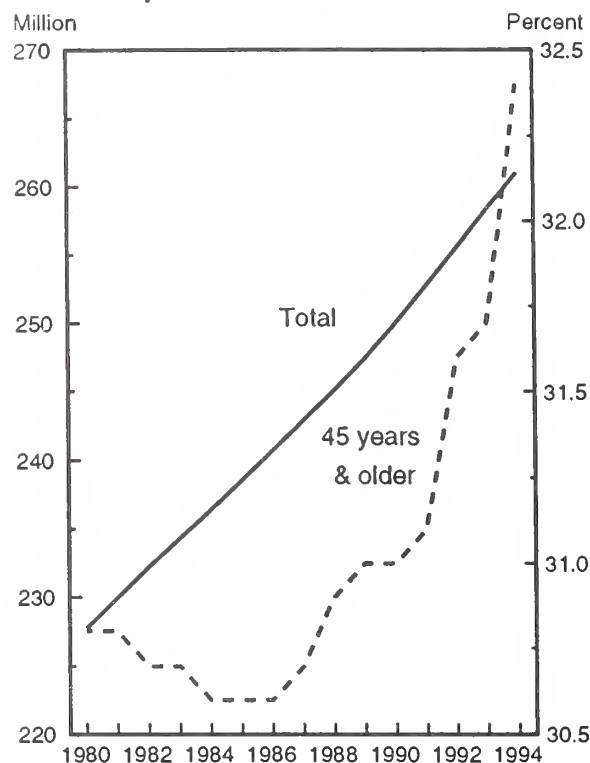
U.S. producers could reasonably expect total domestic consumption to increase faster than the rate of population growth, based on increasing income and aging of the population. In addition, the ethnic composition of the U.S. population is expected to favor increased demand for fruits and vegetables as immigration of Latin Americans and Asians continues to increase.

The export outlook for fruits and vegetables is optimistic, based on recent trends. Horticultural exports have increased faster than total agricultural exports. While, part of the growth in 1994 exports of vegetables to Asia is due to weather-related shortages in Japan and Korea, lower trade barriers and resolution of several phytosanitary disputes promise continued growth in U.S. fruit and vegetable exports.

The recent efforts by U.S. firms to establish marketing relationships in other countries, for example Japan and Mexico, are expected to yield benefits over the long run. With the Japanese, consistent high quality and confidence are the most important ingredients for a lasting partnership.

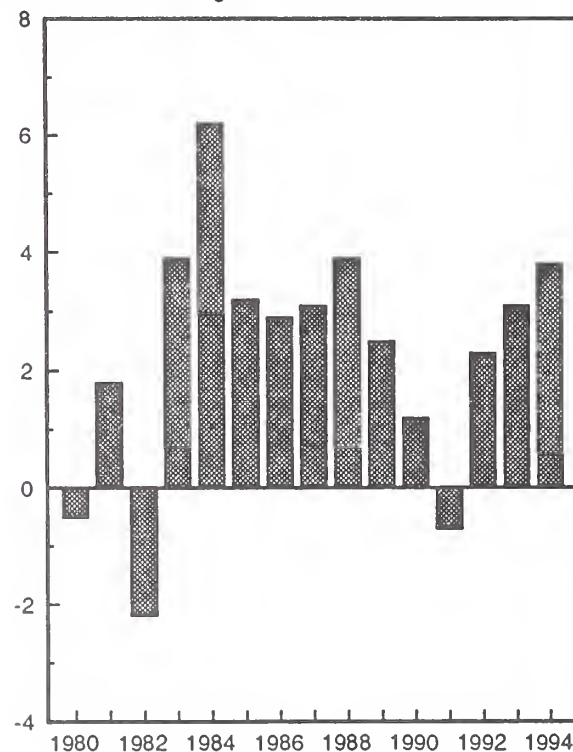
On the supply side, U.S. fruit and vegetable growers continue to improve efficiency in the 1990's. With new production and marketing technologies, growers are likely to increase yields at the long run rate of 1-2 percent per year. Traditional improvements include better varieties and planting and cultivation methods. Scientific advances using biotechnology promise further increases in the quantity and quality of output. Biotechnology which increases pest resistance in plants growing in the field could reduce the costs of pest control. Also, plant genes which reduce perishability or increase the efficiency of canning and freezing could reduce spoilage and waste.

U.S. Population



U.S. Gross Domestic Product (\$1987)

Percent annual change



U.S. fruit yields dipped sharply in the 1980's, due to several severe freezes in Florida and Texas which destroyed citrus trees. Florida growers have replanted citrus groves with higher densities of trees per acre and moved production areas farther south. The Gulf coast region in southwest Florida has developed rapidly as a producer of grapefruit, oranges, and specialty citrus. Texas grapefruit production is increasing, but the urbanization of land values in the Rio Grande Valley is likely to put a cap on production at below pre-freeze levels.

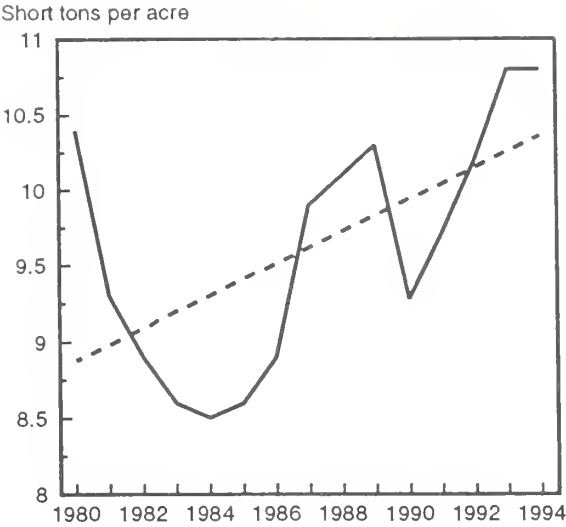
U.S. average yields for noncitrus fruits (for example apples, pears, peaches, and cherries) have increased about 300 pounds (0.15 tons) per year over the last 10 years, compared to about 200 pounds per year for citrus fruits. Area in production of noncitrus fruit, mainly apple orchards, expanded in the 1980's. The expansionary period for apples ended by 1990, and production has continued to increase as trees reach full-bearing age. Similarly, citrus groves in Florida are reaching full-bearing age, and yields are expected to increase rapidly from 1995 to 2000.

Yields of both vegetables and potatoes have risen above the long run trend in recent years. The trend rate of increase for vegetables and potatoes is 4-5 cwt. per acre. Processing tomato yields in California continue to set records, and potato yields in Washington and Idaho were near records in 1994. Fresh-market cabbage, cucumber, tomato, and watermelon yields have increased well-over 2 percent per year over the last 20 years, outpacing other vegetables.

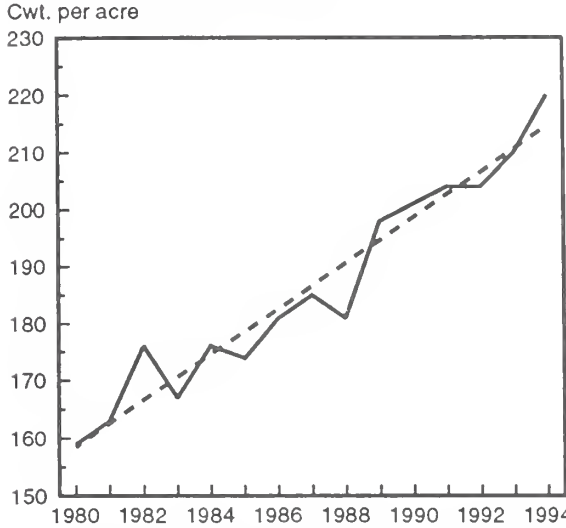
The leading marketing technology for U.S. produce is adding value to fresh fruit and vegetables through convenience packaging (light processing). Packaging lettuce and other salad items for ready use appeals to U.S. consumers and has made inroads into traditional bulk selling strategies. As with foreign markets, new techniques of packaging and selling produce expand the total potential for growth in the horticulture industry.

By adding value to fruits and vegetables--whether through traditional processing, light processing, brand identification, or marketing through food service channels--the horticulture industry will increase the demand for consistency and high quality. Innovators who develop technologies and new sources to meet this demand will profit the greatest in the next 10 years.

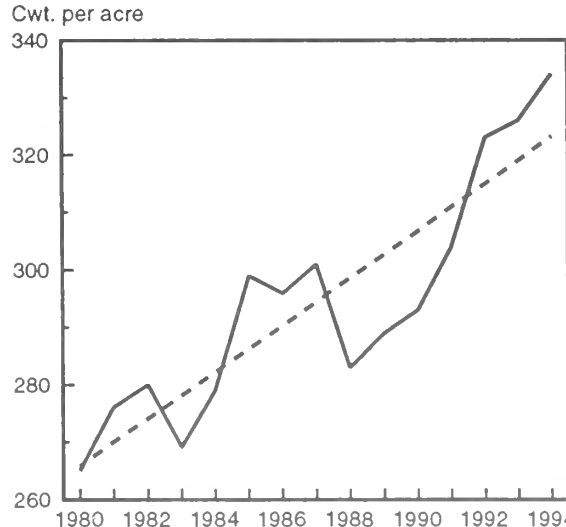
U.S. Fruit Yield



U.S. Vegetable Yield



U.S. Potato Yield



Appendix: Baseline Estimates Procedure

The major economic indicators of production, prices, and trade were projected from recent trends to the year 2000 and 2005. Trends in per capita consumption, imports, and exports, were used to project U.S. production. Projections were made on aggregate categories, such as fresh vegetables, processed vegetables, potatoes, citrus and noncitrus fruits, and dry edible beans. Domestic prices and average values of imports and exports were projected from long run trends. The following tables show baseline projections to the year 2000.

Appendix Table 1—Fruits, tree nuts, and vegetables: Summary of annual average growth rates, 1990-94 and 1995-2000

	-----Period-----			-----Period-----	
	1990-1994	1995-2000		1990-1994	1995-2000
Fruits and nuts			Vegetables		
	--Percent per year--			--Percent per year--	
<u>Per capita consumption:</u>			<u>Per capita consumption:</u>		
Fruits			Vegetables		
Citrus			Fresh	-0.3	0.5
Fresh	2.9	-0.4	Processed	-0.7	0.2
Processed	2.6	0.5	Potatoes		
Non citrus			Fresh	1.7	-1.0
Fresh	0.1	0.7	Frozen	0.9	2.1
Processed	0.7	0.1	Dry beans	0.0	0.7
Nuts	-1.8	0.4	Mushrooms	1.3	0.5
Total	1.8	0.5	Total	0.2	0.5
<u>Production:</u>			<u>Production:</u>		
Fruits			Vegetables		
Citrus	7.2	1.6	Fresh	0.7	1.4
Non citrus	2.1	1.2	Processed	2.0	1.4
Nuts	-1.9	1.4	Potatoes	3.3	1.1
Total	4.2	1.4	Dry beans	-1.1	2.0
			Mushrooms	1.6	1.6
			Total	1.9	1.3
<u>Import value:</u>			<u>Import value:</u>		
Fruits and nuts			Vegetables		
Fresh	3.7	4.0	Fresh	3.9	4.5
Processed	6.1	2.9	Processed	4.8	5.9
Other	-1.1	2.0	Potatoes	4.7	7.9
Total	1.5	2.9	Dry beans	-2.7	3.9
			Other	0.4	3.6
			Total	3.6	5.0
<u>Export value:</u>			<u>Export value:</u>		
Fruits and nuts			Vegetables		
Fresh	7.1	4.5	Fresh	8.4	6.1
Processed	5.4	2.9	Processed	11.4	8.0
Other	8.9	4.0	Potatoes	16.8	7.0
Total	7.6	4.1	Dry beans	-5.9	4.7
			Other	-2.7	2.3
			Total	7.1	6.1

Appendix Table 2 –U.S. fruit industry: Area, production, value, unit value, and trade, 1992-1995, 2000

Item	Unit	1992	1993	1994 1/	1995 1/	2000 1/	Growth 1995-2000
							Percent per year
Bearing area	1,000 ac.	3,580	3,650	3,620	3,685-3,725	3,708	0.0
Citrus	1,000 ac.	886	947	979	980-1000	973	-0.3
Oranges	1,000 ac.	640	688	712	740-770		
Other	1,000 ac.	246	259	267	230-240		
Noncitrus	1,000 ac.	2,018	2,027	1,953	2,030-2,040	2,032	-0.0
Apples	1,000 ac.	453	460	458	455-460		
Other	1,000 ac.	1,565	1,567	1,495	1,575-1,580		
Tree nuts	1,000 ac.	676	676	688	680-685	676	-0.2
Production	S. tons	30,183	32,490	32,004	33,000-34,000	35,961	1.6
Citrus	S. tons	12,452	15,274	14,508	15,778	17,081	1.6
Oranges	S. tons	8,909	10,992	10,281	11,364		
Other	S. tons	3,543	4,282	4,227	4,414		
Noncitrus	S. tons	17,287	16,732	17,030	16,750-17,250	18,372	1.6
Apples	S. tons	5,237	5,303	5,367	5,450-5,550		
Other	S. tons	12,049	11,429	11,663	11,300-11,700		
Tree nuts	S. tons	445	484	467	475-500	509	0.9
Value	\$ mil.	9,844	10,012	9,746	10,000-11,000	12,457	3.6
Citrus	\$ mil.	2,401	2,161	2,276	2,100-2,300	2,845	5.0
Oranges	\$ mil.	1,545	1,490	1,582	1,400-1,600		
Other	\$ mil.	856	671	695	600-700		
Noncitrus	\$ mil.	6,025	6,143	6,022	6,000-7,000	7,835	4.0
Apples	\$ mil.	1,431	1,370	1,323			
Other	\$ mil.	4,594	4,773	4,699			
Tree nuts	\$ mil.	1,417	1,708	1,447	1,700-1,900	1,776	0.1
Unit value	\$/ton	326	308	305	300-325	346	2.0
Citrus	\$/ton	193	141	157	140-150	167	2.8
Oranges	\$/ton	173	136	154	130-140		
Other	\$/ton	242	157	164	150-160		
Noncitrus	\$/ton	349	367	354	365-390	426	2.4
Apples	\$/ton	273	258	247			
Other	\$/ton	381	418	403			
Tree nuts	\$/ton	3,188	3,528	3,101	3,500-3,750	3,492	-0.7
Trade 2/							
Imports	\$ mil.	4,733	4,419	4,624	4,600-5,200	5,758	3.3
Fresh	\$ mil.	1,840	1,824	1,899	2,000-2,300	2,483	2.9
Bananas	\$ mil.	1,097	1,071	1,070	1,050-1,150	1,299	3.3
Other	\$ mil.	743	753	829	1,000-1,100	1,184	2.4
Processed	\$ mil.	532	503	514	500-525	615	3.6
Juices	\$ mil.	808	649	664	700-800	808	1.5
Wine	\$ mil.	1,087	976	1,051	900-1,000	1,121	2.3
Nuts	\$ mil.	467	467	496	450-500	731	8.6
Exports	\$ mil.	3,754	3,850	4,347	4,125-4,800	5,430	3.9
Fresh	\$ mil.	1,613	1,633	1,886	1,875-2,200	2,470	3.8
Citrus	\$ mil.	627	629	653	625-700	782	3.3
Noncitrus	\$ mil.	986	1,004	1,233	1,250-1,500	1,688	4.1
Processed	\$ mil.	628	627	648	650-700	755	2.2
Juices	\$ mil.	420	430	488	450-525	494	0.2
Wine	\$ mil.	166	166	179	160-180	191	2.4
Nuts	\$ mil.	927	994	1,146	1,000-1,200	1,520	6.5

1/ ERS forecasts include all ranges, 1994 trade and 2000 point estimates. 2/ Excludes melons. Nuts exports excludes peanuts.

Sources: Economic Research Service (forecasts and trade) and National Agricultural Statistics Service, USDA.

Appendix Table 3--U.S. vegetable industry: Area, production, value, unit value, and trade, 1992-1995, 2000

Item 1/	Unit	1992	1993	1994 2/	1995 2/	2000 2/	Growth 1995-2000 3/ Percent per year
Area harvested	1,000 ac.	6,254	6,236	6,700	6,200-6,700	6,420	-0.8
Vegetables							
Fresh-market	1,000 ac.	1,877	1,838	1,834	1,775-1,850	1,730	-0.9
Processing	1,000 ac.	1,446	1,376	1,563	1,400-1,500	1,336	-1.8
Potatoes	1,000 ac.	1,397	1,397	1,458	1,470-1,500	1,457	-0.4
Dry edible beans	1,000 ac.	1,530	1,622	1,845	1,800-1,900	1,894	-0.4
Mushrooms	Mil. sq. ft.	142	136	135-145	130-150	150	1.4
Production	Mil. cwt	1,143	1,143	1,261	1,120-1,250	1,293	1.7
Vegetables							
Fresh-market	Mil. cwt	393	387	392	375-400	424	1.8
Processing	Mil. cwt	285	288	355	280-325	322	1.4
Potatoes	Mil. cwt	437	440	472	440-490	502	1.4
Dry edible beans	Mil. cwt	27	28	34	28-32	36	3.0
Mushrooms	Mil. cwt	8	8	8	7.6-8.2	8	1.1
Value	\$ mil.	11,223	12,176	11,757	12,000-12,500	14,256	3.0
Vegetables							
Fresh-market	\$ mil.	6,428	6,920	6,279	6,700-7,100	8,061	3.1
Processing	\$ mil.	1,126	1,157	1,428	1,250-1,300	1,437	2.4
Potatoes	\$ mil.	2,483	2,807	2,647	2,500-2,900	3,202	3.5
Dry edible beans	\$ mil.	516	607	684	550-650	770	4.0
Mushrooms	\$ mil.	670	686	721	710-740	786	1.7
Unit value 4/	\$/cwt	9.82	10.65	9.25	9.00-10.50	11	1.3
Vegetables							
Fresh-market	\$/cwt	16.34	17.90	16.03	17-18	19	1.6
Processing	\$/cwt	3.96	4.01	4.02	4.00-4.25	4	1.6
Potatoes	\$/cwt	5.68	6.38	5.60	5.50-6.50	6	0.7
Dry edible beans	\$/cwt	18.87	21.50	20.05	20-25	23	0.6
Mushrooms	\$/lb.	0.86	0.90	0.94	0.91-0.93	1	0.5
Trade 5/							
Imports	\$ mil.	1,791	2,147	2,309	2,300-2,700	3,060	4.4
Vegetables							
Fresh & melons	\$ mil.	880	1,158	1,249	1,300-1,450	1,486	2.4
Canned, frozen	\$ mil.	488	491	575	500-600	817	6.9
Potatoes	\$ mil.	101	154	160	150-175	219	5.8
Dry beans	\$ mil.	26	25	30	30-40	52	4.6
Other	\$ mil.	297	319	296	300-400	486	6.4
Exports	\$ mil.	2,234	2,465	2,613	2,500-2,900	3,613	5.4
Vegetables							
Fresh & melons	\$ mil.	854	936	969	900-1,000	1,276	5.5
Canned, frozen	\$ mil.	478	523	544	500-600	837	7.3
Potatoes	\$ mil.	365	435	566	550-650	722	4.4
Dry beans	\$ mil.	192	213	279	250-300	392	5.0
Other	\$ mil.	346	357	255	300-350	386	3.6

1/ Sweet potatoes included with potatoes. Dry peas and lentils included with dry edible beans.

2/ ERS forecasts include all ranges, 1994 trade, and 2000 point estimates. 3/ From mid-point of 1995 range.

4/ Ratio of total value to total quantity produced. 5/ Other includes mushrooms, dehydrated vegetables and vegetable seed.

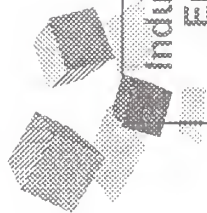
Sources: Economic Research Service, National Agricultural Statistics Service, USDA and U.S. Department of Commerce.

Appendix Table 4--U.S. greenhouse and nursery industry: Area, value of production, and trade, 1992-1995, 2000

Item	Unit	1992	1993	1994 1/	1995 1/	2000 1/	Growth 1995-2000
							Percent per year
Area in production							
Under protection	1,000 sq. ft.	788,265	797,300	821,500	848,800	985,000	3.0
In the open	Acres	621,283	634,600	652,000	669,600	750,000	2.3
Cut flowers							
Under protection	1,000 sq. ft.	129,542	132,000	135,000	138,000	160,000	3.0
In the open	Acres	25,806	27,000	28,000	30,000	36,000	3.6
Cut greens							
Under protection	1,000 sq. ft.	7,921	8,300	8,500	8,800	10,000	2.6
In the open	Acres	6,452	6,600	6,800	7,000	8,000	2.7
Potted flowering plants							
Under protection	1,000 sq. ft.	139,158	140,000	145,000	150,000	175,000	3.1
In the open	Acres	4,614	4,800	5,000	5,200	6,000	2.9
Foliage plants							
Under protection	1,000 sq. ft.	150,996	153,000	155,000	157,000	175,000	2.2
In the open	Acres	10,418	10,500	10,700	10,900	12,000	1.9
Bedding plants							
Under protection	1,000 sq. ft.	228,236	230,000	240,000	250,000	300,000	3.6
In the open	Acres	13,816	14,200	14,500	15,000	18,000	3.6
Sod (turfgrass)							
In the open	Acres	218,161	221,500	227,000	231,500	250,000	1.5
Nursery plants							
Under protection	1,000 sq. ft.	132,412	134,000	138,000	145,000	165,000	2.6
In the open	Acres	342,016	350,000	360,000	370,000	420,000	2.5
Value of production	\$1,000	9,128,799	9,262,077	9,500,000	9,700,000	12,000,000	4.3
Cut flowers	\$1,000	518,881	473,644	480,769	509,050	650,000	4.9
Cut greens	\$1,000	126,223	131,028	135,747	141,403	175,000	4.3
Potted flowering plants	\$1,000	823,246	805,436	812,568	839,653	1,050,000	4.5
Foliage plants	\$1,000	623,256	661,687	671,533	686,131	800,000	3.1
Bedding plants	\$1,000	1,391,175	1,505,068	1,681,196	1,743,462	2,200,000	4.7
Sod (turfgrass)	\$1,000	471,640	478,715	490,680	500,500	575,000	2.8
Nursery plants	\$1,000	5,174,378	5,206,499	5,227,507	5,279,801	6,550,000	4.3
Imports	\$1,000	561,872	581,730	632,392	650,000	775,000	3.5
Cut flowers	\$1,000	312,028	310,410	340,580	350,000	450,000	5.0
Nursery, greenhouse	\$1,000	249,844	271,320	291,812	300,000	325,000	1.6
Exports							
Nursery, greenhouse	\$1,000	216,222	230,946	230,299	250,000	300,000	3.6

1/ ERS estimates (1994), forecasts (1995, 2000).

Source: Economic Research Service and National Agricultural Statistics Service, USDA.



Industry Perspectives in an Era of Globalization of Markets and Growing Regulatory Requirements

Bryan Silbermann
Executive Vice President
Produce Marketing
Association



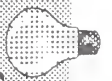
Key Issues

- Consumption
- Globalization
- Role of Governments



Consumption

- Will F&V consumption continue to rise?
 - Convenience
 - Fresh cut salads
 - Ready meals with vegetables
 - Fruit next
 - F&V as snack food
 - What the numbers don't tell you: processed = no waste



Consumption

- Will F&V consumption continue to rise?
 - Nutrition
 - Lowering fat
 - Reduced cancer risk
 - "Feeling better"
 - Rising vegetarianism

Consumption

- Will F&V consumption continue to rise?
 - Better Taste
 - Varieties
 - Bioengineering
 - Riper fruit to market
 - New distribution technologies

Consumption

- Will F&V consumption continue to rise?
 - Greater availability
 - Offshore sourcing
 - U.S. involvement in production/distribution
 - Alternative store formats
 - Foodservice growth

Produce Variety Grows

- Variety Growth
 - 1975 - 65 SKUs
 - 1985 - 200 SKUs
 - 1995 - 300+ SKUs
 - Space will grow 20%++ by 2000
 - What the numbers don't tell you, part 2 -
 - ...eating differently



Answer - YES

- But building consumption means innovative promotion strategies, new products and distribution channels, not new acreage
- And tracking consumption means watching the marketplace, not the farm gate

Behind the success

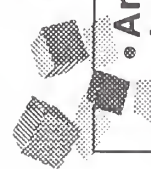
...the critical element in
produce growth at all levels



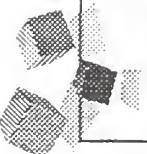
Consumption

• Are consumers really more
health conscious in their
eating habits?

- YES ... and
- NO



Yes they are
really more health
conscious.



No this often
doesn't translate
into their eating
habits.



Feast and famine
approach to eating:
we are masters of
self delusion



Our diet has too much
fat and too little fiber

- Processed food industry has built our food culture through \$million advertising campaigns
- We're becoming a society largely unfamiliar with food preparation/cooking: "out of the box" eating rules



Five A Day: Is It
Achievable?

- Current levels around 3.5 servings
- As a long-term goal - Absolutely!
- Current spending by industry minimal
- Needs ongoing funding commitment: HOW?

Globalization

- Can exports continue to grow?
 - F&V exports great success story
 - U.S. a high quality producer
 - Mexico and South America
 - Pacific Rim

Globalization

- Can exports continue to grow?
 - The 3 Cs:
 - Crop conditions
 - Currency
 - Competition

Is U.S. industry prepared for an international marketplace?

- Vast improvements
- Export "consolidators" doing very well
- Our best are very good
- Bigger crops (e.g. apples) are forcing greater export orientation

Government/industry partnerships

- In exports:
 - MPP has been a vital effort for produce
 - Getting trade barriers down is crucial (Japan, Mexico, etc.)
 - Government role is to "run interference"

Globalization

- Declining U.S. consumer spending on food is driving some highest quality produce to export. Same is true with our offshore suppliers. Our cheap food supply means U.S. consumers sometimes won't pay for the best.

Governments can help

- Market information services
- Minor use pesticide registration
- Opening foreign markets (government to government)
- Continue initiative to get more fresh produce into school lunch programs
- Give horticultural crops their proper due: 20% of exports!

Will the recent trend to increasing regulatory burdens continue?

- Areas where most pressing:
 - Environmental
 - Access to minor use
 - OSHA
 - Farm labor
 - Concern over HACCP

BRIEFING ON THE JAPANESE FRESH PRODUCE MARKET

Jon Kristopher Jenni
Senior Agricultural Attache
U.S. Embassy - Tokyo

THE MARKET SITUATION

First, some basic facts:

- No matter how you look at it, whether from a foreign or domestic viewpoint, this is a huge market:
- In 1993, Japan produced \$21.5 billion worth of fresh vegetables and \$11.5 billion worth of fresh fruit.
- In addition, imports provided 25% of Japan's total fresh fruit supply and 4.4% of fresh vegetable supply.
- 1993 Japanese Imports of Fresh Fruit (excluding bananas) were \$864 million, of which \$630 Million was from the U.S. about a 73% market share
- Japanese imports of fresh vegetables were \$525 Million of which \$148 million was from the U.S., a 28% market share.

There are two distinct stories in the Japanese fresh produce market: Fresh Fruits and Fresh Vegetables. The market situation of these two categories is distinct, the way the markets work are different.

Fresh Fruit is not seen as a main component of a healthy diet. Instead, fruit is seen as a "goodie", suitable for desserts, and especially for the high end gift market. As a regular food however, fruit is seen as too expensive, lacking in nutrition, and is loosing out to baked desserts and other sweets. Japanese fresh fruit consumption is gradually declining.

From the market point of view, the U.S. has the market locked up. There are only a few major competitors and most of these are specialized in a few commodities, such as pineapples for the Philippines, and out-of-season fruit for New Zealand.

The U.S. dominance is especially strong in the Citrus area, which accounts for more than 75% of our fruit exports to Japan. Other than citrus, Cherries are a big item, followed by Strawberries, Papayas, and Melons.

The *near-term* forecast for the imported fruit market is for continued stability, with the market for most temperate zone product being mature. Growth for U.S. products over the next few years, is expected to be gradual and sustained. Items that should see more than gradual near-term growth include Apples, which of course just started coming into Japan, and melons, which jumped from \$15 million in imports in 1993 to \$25 million in 1994.

Over the longer term, however, we expect fresh fruit imports to grow much more strongly. While fresh consumption is falling, local production is falling even faster, making room for imports. But let me come back to that in a moment.

Unlike fruit, *Fresh Vegetables* are seen by Japanese consumers as an essential part of the diet, and consumption, both in fresh and processed forms remains strong. Furthermore, while the Japanese can be extremely conservative about food, new types of products such as broccoli, have received a warm reception in Japan.

From the market point of view, Japan has traditionally had a much higher level of self sufficiency for vegetables than for fruit, and the market for imports has correspondingly been much smaller. It is also split up among a much larger range of countries, including China, New Zealand, Mexico, and the U.S. with no one country being dominant.

This situation is changing rapidly, however. As I will discuss in a moment, Japanese vegetable output is on a downward trend, leading to a relative shortage of supply. This is compounded by the strong exchange rate which has made imports more affordable, and by substantial and continuing improvements in transportation technology, which ease the handling of delicate perishables. A final and growing factor is the increasing demand of the Japanese for year-round availability.

All this means that the market for imported fresh vegetables is booming, and that for products grown by the United States, the U.S. is enjoying its share of the growth. In fact, based on our projections, the total value of vegetable imports could rival that of fruit imports for the first time in the next year.

U.S. product is dominated by Broccoli and Asparagus, and to a lesser degree by Onions and Head Lettuce, and it is these products that are driving the growth for the U.S. We expect total imports of U.S. vegetables to hit \$233 million in 1994, up from \$148 million in 1993.

Looking at these items closely, we can see that the Japanese basically can't get enough Broccoli, we're expecting just over \$135 million in imports in 1994. As the U.S. is essentially the only broccoli supplier to Japan, this puts us in an outstanding opportunity to profit from this products popularity.

Asparagus, while less dramatic is also making an impressive contribution to U.S. export growth. Unlike broccoli, there are plenty of competitors, however, these offer product at different times of the year. U.S. asparagus has little direct competition during its marketing season.

Onions are an important product, and we saw a lot of growth last year, especially towards the end of the year, but this is basically an opportunistic market, depending on shortages in local supply.

Lettuce is less straight forward. Our shipments do depend on local supply conditions to a degree, but we're also seeing sustained growth in shipments. In general, we see especially

great potential for leafy vegetables, however, we are currently hampered by an extremist approach to import fumigation that damages the quality of our lettuce, celery, and other exports.

THE FUTURE

Let me turn now to the future, by which I mean the next 10 years. Part of the reason for the current surge in imports and the extremely high levels of interest in foreign sources of vegetables, is that Japanese output of these products is declining on a year-to-year basis. Local trade contacts are convinced that this decline is going to accelerate significantly in the years ahead, based on what they see down on the farm.

The most visible problem is the advanced age of most of Japan's farmers. As in many other countries, the average farmer is getting older, and there are too few young people entering the profession. This problem is found throughout the industrialized world, but rarely is the situation so extreme as in Japan.

Let's focus on full-time and what I call "main-time" farmers, (farmers working on the farm more than 50% of the time). The vast majority of Japanese farms and farmers are actually less than "main-time", but these produce a relatively small share of output, especially of nongrain products.

There are 1.9 million Japanese men who describe themselves as "mainly farmers", that is, men engaged in farming more than half-time. Of these, 61% are age 60 or over, (and two-thirds of these are over age 65!). Another 15% is age 50 to 59, while only about 11% are age 16 to 39. The people growing most of the food in Japan are well into retirement age.

At the other end of the equation, Japanese agriculture is attracting very limited interest from young people. The Ag Ministry estimates that only 2,000 or so young men enter the farming profession each year, and this figure is unlikely to increase.

Looking ten years down the road, this will spell a dramatic change in the current farm labor population. Of the current 1.9 million males mainly engaged in farming, 1,164,500 will be over age 70 and will presumably have retired or passed away. Most of the 293,440 "main-timers" currently in their 50's will have moved into the ranks of farmers over age 60.

On the positive side, perhaps 300,000 or so men in their 50's who currently farm less than half-time, will likely become full-time farmers after retiring from office or factory work at age 60. Finally, perhaps 20,000 young men are also likely to become farmers during this time. But even with these additions, it is likely that the main group of Japanese farmers will be less than 930,000 in ten years time, about half the current number.

Now, in most other countries, a steep decline in manpower would be met by an increase in farm size through consolidation. Japan, however, is not likely to go down this path, due to legal and cultural constraints.

The average Japanese farm is only 3.5 acres, and is often a series of irregularly shaped, discontinuous plots scattered over a wide area, which explains much of the inefficiency of Japanese agriculture. Unfortunately, legal and cultural constraints have kept farm size small, and are likely to continue freezing farm size, even if it means land becoming permanently idle.

Japanese land law dates from the post-War period, and was designed to prevent the reemergence of feudal estates. These laws make it virtually impossible for the farmers to sell land to another farmer, let alone to a non-agricultural user.

Similarly, the law makes leasing of land extremely difficult, allowing a landholder to rent out no more than 2.5 acres of his land, and then only with the permission of the government. These laws have become more relaxed over time, but the restrictive mentality they represent is still very much in place. It is backed up by an agricultural finance system and tax regime that are very prejudicial to the transfer, and thus, consolidation of farm land.

Finally, rural Japanese society attaches a tremendous stigma to the sale of ancestral land. Even farmers without a successor, would often rather see their land go idle, than incur the shame of having "sold out".

We feel that the fresh produce sector is likely to bear the brunt of the coming demographic changes because the full and main time farmers are the ones most likely to specialize in high value production such as this.

In addition to having a shrinking labor pool, the fresh produce sector is enfeebled by the inefficient nature of Japanese farming. As imports play a growing role in the Japanese produce market, driven by the recent dramatic increase in the yen, which makes dollar-priced products more affordable, Japanese fruit and vegetable producers will find the competition increasingly difficult to meet.

So, where will these trends lead? That's a good question for a Ph.D. dissertation. Local sources give widely varying predictions, ranging from 30% to 70% declines in output over the next decade. Looking at the dropping labor force and rigid land use, these estimates do not seem outlandish.

If we go with a 50% decline, this would imply an offsetting increase in vegetable imports (both fresh and frozen) from \$1 billion to a phenomenal \$11 billion. The Japanese fruit sector is quite competitive and is characterized by a longer term investment horizon, so let's say that fruit output would only drop 25%. This would mean an increase in imports from \$1.4 billion to \$2.3 billion.

These are back of the envelope figures here, so I'm not putting them out as true quantitative predictions, but it's accepted as fact in Japan, that the nation is going to experience a catastrophic decline in local fruit and vegetable supply over the next decade. This shortfall will have to be met by imports.

THE COMPETITION

As this new market emerges, what will the competition look like?

On the fresh fruit side, there isn't any obvious competition on the horizon. For temperate zone fruit, Canada, Chile and New Zealand could become players, but then again, they may not, and of course the Southern Hemisphere suppliers are counter seasonal. China is potentially a factor in the fruit market, but so far, the Chinese are a minuscule force in the Japanese fruit market, and no one in the trade is mentioning them as a likely market mover. On the tropical side, it's an open question. Bananas are the single biggest fruit import, and these are likely to be increasingly joined by other, more exotic tropicals. Currently, obvious competition like Filipino papaya is checked by problems with poor quality, but this may not be true in the future. Furthermore, I've casually observed an increasing number of exotic fruits, such as carambola, cherimoya, durian, and frozen rambutan on offer at receptions in prestige hotels, and in the produce sections of up-scale retailers. It's hard to say whether these new products will acquire enough of a following to compete with temperate zone products.

On the vegetable side, however, it's a whole different story. The chief competition for fresh vegetables is China and Southeast Asia, and everyone in the Japanese produce business is pointing to these suppliers as a threat to U.S. exports. While these countries traditionally grow so-called oriental vegetables, production of western vegetables is increasing, much of it with seed and expertise from Japanese trading companies. This is true not only for fresh vegetables, but also for frozen, due to heavy Japanese investment in quick freeze facilities.

This is not a sure thing, however, especially with China. First of all, there have reportedly been horrendous problems with quality from China, problems which seem slow to fix. In the longer term, I have to wonder whether Chinese production will be able to keep up with exports and burgeoning domestic demand. The Chinese authorities have already shown that they are willing to clamp down on exports in order to keep internal prices low. This is less likely to be a problem for other, more prosperous suppliers like Thailand and Taiwan, both of which I expect to provide stiff competition into the next century.

Of course we could also look at this "Asian challenge" as an opportunity. Japan's vegetable repertoire includes products that are alien to U.S. culture, but which are traditional in East Asia. These products include burdock root, lotus root, Chinese cabbage (hakusai), Japanese radish (daikon) and other products which can be grown and exported from China and other neighbors to Japan. While none of these are traditional items in U.S. agriculture, most can be grown in the U.S. If local production of these items drops as we expect, there will be a market for whoever grows the stuff.

THE JAPANESE DISTRIBUTION SYSTEM

Now, let me briefly outline the system for distribution of fresh produce in Japan, as it currently works, and some of the changes we see coming in the near future.

As the market currently works, the Japanese importer is often the key to the market. Once product is loaded for export from the U.S., the importer can take control of the situation and make all arrangements for further distribution.

Importers often represent the single interface U.S. exporters have with Japan. Importers collect orders and other indicators of market demand from retailers and wholesalers and then, in turn, place orders with U.S. suppliers. Typically, U.S. product is sold on a fixed price basis, with price discovery occurring in advance through negotiation, and cash paid prior to export from the U.S. port. The importer takes almost all of the price risk for any change in price during the 3 to 6 week delivery lag. He pays up front and must then find the best price available on the market upon receipt of the product.

Major wholesalers are the traditional customers of importers. Large wholesalers typically will have accounts with several importers, committing themselves to buying an agreed upon percentage of a given importer's available wares at an agreed upon price during the course of the year.

There are two major ports of entry: Tokyo and Osaka/Kobe. Most fresh produce comes through these two ports. The key players are a handful of importers, either trading companies or specialized distributors. Many of these in turn, are branches of major wholesalers in either Tokyo, Osaka/Kobe, or even Kyoto

Tokyo's main wholesale market, Ohta Market, is the linchpin to the whole system, and Ohta's wholesalers and jobbers are extremely powerful market players. In general, the distribution system in place at Ohta market is typical of how most imports are handled.

Importer -> Wholesaler -> Jobber -> Retailer

Note that imported products, unlike domestic products, do not go through auction, (except in Sapporo and Hiroshima). There is a lot of misinformation on this point.

The system is largely the same for large cities other than Tokyo, the so-called Class I markets:

- There are 12 cities served by Class I Wholesale markets: Typical of these are Sapporo, Nagoya, and Fukuoka.
 - = Wholesalers in these markets, while not engaging directly in import, like, say those in Tokyo, are powerful market players who deal directly with importers, skipping Ohta Market.
- Beyond these major cities, there are 70 smaller cities served by so-called class II and III wholesale markets. These markets are significantly less developed than Tokyo, Osaka or other Class I cities, and are not well plugged into the import distribution system. Wholesalers in these markets typically do not have contacts among the importers and must typically buy their imported product after it has gone through jobbers in Ohta

market, thus adding several additional layers.

Changes Likely in the Near Future

The traditional, multi-layer system I just described is still largely in place. However, given the continuously growing influx of imported produce, plus other changes going on in the Japanese economy, competition is gnawing away at the margins at all layers of the system, creating pressure to simplify matters.

Actual distribution now depends on the importer and also on the product, as well as on the end-buyer. Different importers have different policies. Some will only work with wholesalers, while others are willing to cut out wholesalers and sell direct to retailers.

Japan's retailers are increasingly in the driver's seat when it comes to fresh produce. Retailers, more and more, are insisting on very specific requirements for fresh produce, accepting, say, only a single size for grapefruit, while also trying to cut out distribution layers and costs, where ever possible.

One obvious place to cut is the wholesalers and jobbers, but these players provide useful services in terms of sorting, repacking, after-sale service, etc. Bringing all these functions in-house would add unacceptably to the complexity of either importers' or retailers' operations.

Finally, the position of importers themselves is increasingly open to question. Most importers, especially trading companies began business as "quota holders" in the days when imports were strictly controlled. These firms had to do little real marketing to move their imports since there was little real competition. Some believe that the traditional importers are not prepared for the increasing competition of the open market

Large retailers, for their part, are increasingly avoiding both the wholesalers and the importers, and procuring product directly from the overseas supplier.

Japanese industry observers increasingly agree that U.S. suppliers who really want to succeed in the market will no longer be able to depend on one-stop-shop importers to represent them in the market, but will increasingly need to develop their own market presence and relations with retailers, through a Japan-based office, or other arrangements.

The main point is that all of the traditional connective tissue in the distribution system is likely to change, and in some cases disappear, over the next few years. The problem is that it is hard to predict how the new system will look.

To function in the Japanese market, U.S. firms need to maintain and respect their current customer base in Japan, that is to say, their current importers. But U.S. firms that want to be well prepared for coming change in the importer/wholesaler/retail system will have to develop their own, stand alone relationships with their ultimate customers, the retailers. Then, no matter how the system evolves, or whether or not your importer remains a link to

the market, you still have a personal connection with your end-user

PROBLEMS FACED BY U.S. PRODUCE SUPPLIERS

Let me comment now on some of the main impediments to U.S. produce exports to Japan. There are three recurrent problems that come up that make it harder to market U.S. horticultural products in Japan. All of them are manageable.

Plant Quarantine Issues:

- These fall into two categories: Outright prohibitions and nagging restrictions.
- = The outright prohibitions are on products such as fresh tomatoes, cabbage, green peppers, potatoes, peaches and pears. Each of these carries or is alleged to carry some noxious pest or disease. Resolving the issues in these cases is an on-going process, but one that is increasingly going smoothly.
- = The nagging restrictions are less of a problem, but probably more of a headache on a day-to-day basis. The main problem I've already touched on, is Japan's love affair with fumigation. Any live bug, be it a beneficial, such as a ladybug, or a universally established pest, such as an aphid, will trigger fumigation upon detection, adding cost, and diminishing quality, for American produce. Another problem is a shortage of Japanese inspectors, which can cause back ups at the port of entry, or which can limit the volume of exports for products which must be inspected in the U.S., such as cherries, apples and papayas. Both of these issues are under discussion currently.

Quality:

- Quality in Japan simply means more than it does in the U.S. and what may be seen as top of the line on the U.S. market may not be acceptable in Japan.
- For example, for most products, USDA#1 Extra Fancy, or the equivalent, simply isn't enough. The top USDA grades still allow too much variation in size, too many cosmetic defects, and too uneven coloring to be acceptable in Japan. All of these parameters must be essentially perfect. Experienced U.S. growers and shippers know this and successfully manage the problem, but quality invariably trips up first timers.

Food Safety:

- Domestic agricultural interests have spent years of effort and millions of dollars convincing Japanese consumers that imported foods, especially fresh produce, are inherently less safe than Japanese grown product. Most Japanese consumers are convinced that U.S. pesticide residue standards are not as strict as those in Japan, and that they are not as strictly enforced.
- Whether we like it or not, this perception is a permanent part of business in Japan that

damages the image of all U.S. products.

- Again, though, this is a problem that can be managed. We know that our regulatory system guarantees safe food, and we have the confidence of the Japanese health authorities, which is a big help.
- On the PR front, which is the real issue, the Japanese public seems to have wearied of the hysteria against imported foods. This means that the U.S. Embassy, working with the relevant commodity group or organization, can address each crisis as it arises and, increasingly, nip it in the bud. An excellent example is the recent detection of TBZ on U.S. apples. Whereas two years ago, this would likely have triggered a shut down in our shipments, so far, we have been able to handle this issue at the technical level, and have seen only minor commercial impact.

THE PROCESSED MARKET

For the sake of time, I've focussed purely on the fresh fruit and vegetable market. So let me just touch on a few points with respect to processed products. If there are any questions in this area, I'd be happy to entertain them later.

Briefly, the situation I've outlined for fresh products (declining local production and increased imports) holds true for processed products as well.

On the fruit side, juices represent the major processed sector. Japanese juicing has traditionally meant mikan juice, and this industry has all but disappeared under a wave of imported orange juice. Other juices, such as apple or grape, are residual uses only. There is no true stand alone juice industry for these products.

The market for imported juice is strong and growing. We expect imports, and consumption to continue growing at a respectable rate for the foreseeable future. Canned fruits are stable, while frozen fruit is a small and shrinking market.

On the Vegetables side, frozen vegetables are the key sector, with potatoes representing 40 percent of total supply. Demand for frozen vegetables is extremely strong, especially in the food service and food processing industries, where labor and energy costs are at a premium. Domestic production is rising respectably, reflecting strong demand, but I question how long this growth can continue, given diminishing fresh output. Imports represent more than three quarters of the market, and again, potatoes are a key component. Frozen vegetable imports have seen significant growth over recent years, a situation that is likely to continue is likely to continue in the future, and in fact should go into high gear as frozen imports rush in to replace lost local fresh production.

Marsha Martin, Moderator
Chairman, Farm Credit Administration

Good morning. Welcome to the Farm Income and Finance Session of the 1995 Agricultural Outlook Forum. We will do things a little differently this year. We will focus on the longer term outlook, as well as the forecast for next year. We want to get each of you more involved, so our presentations are going to be brief with more time devoted to questions and answers from the floor. It is my pleasure now to introduce you to each of our panelists.

Mitchell Morehart is an agricultural economist with the Economic Research Service.

Robert E. Young II is the Co-Director for the Food and Agricultural Policy Research Institute at the University of Missouri/ Columbia.

Cole Gustafson is the Chair of the Department of Agricultural Economics at North Dakota State University.

Mark Drabenstott is Vice President and Economist at the Federal Reserve Bank of Kansas City.

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During the past three years, as you know, the over all U.S. economy has been pretty favorable to agriculture. Real economic growth has been sporadic but positive. Some regions of the country continue to struggle but improvement has been fairly widespread. Nationally, annual real growth rates in GDP averaged 3.1 % from 1992 to 1994. Importantly, one key variable directly benefiting agriculture across all regions of the economy until last year, was interest rates. Interestingly, short term interest rates were pushed up this past year on seven different occasions, for a total increase of 3 percent, in an effort to control inflation. And yet, inflation, another key variable helping agriculture, averaged just 2.4% over the last 3 years.

Over the last several years, with some regional and commodity variations of note, the agricultural economy has been relatively strong as well. Net cash income has held relatively high and stable in recent years, averaging just over \$55 billion from 1987 through 1993. Over that same period, the value of farm real estate assets rose by about \$120 billion. Since farm debt remained relatively flat, agriculture's debt-to-asset ratio declined to a healthy 16%.

The asset gain may sound impressive, but in real dollar terms, farmland values were fairly flat over the same time period. Another measure of the sector's earnings, net farm income, has been more variable. However, in real dollar terms, both net cash income and net farm income were down in 1994 as compared to a few years ago.

When we talk of good times in the agriculture sector, there is always a paradox. Because agriculture achieved such great production levels in 1994 (with production levels for some crops such as corn, rice, sugar, soybeans and cattle at record highs), we expect agriculture income may decline in 1995. On the other hand, technology coupled with trade agreements have shortened time and distances among major world markets, creating a more responsive pricing mechanism in the global markets for many goods and services including the financing of such transactions.

But we're not here to talk just about the short run, we want to talk about the longer term prospects for agriculture as well. Let me highlight some of the variables that we are going to discuss today and the impact they will have on agriculture.

Technology: Ever in rich abundance in the U.S. -- and consequently, world-wide -- technological advances imply that we can produce more, better and faster, with less. This puts U.S. farmers in direct competition with themselves and with their foreign counterparts. It forces them to accept, even to seek out, technological innovation and its resultant cost-efficiencies.

Public policy: Recent trade agreements should lead domestic producers to greater access in a host of international markets. Last year, Congress enacted crop insurance reform, providing nearly all producers with the opportunity for some type of minimal disaster protection at little or no cost. These actions hold promise as a means of opening markets, lowering production risks, and providing quicker and more market-oriented price signals.

At the same time, there are a number of forces that suggest increased market volatility and risks for farmers. Looming budget reduction measures imply less supportive commodity programs. While regulatory agencies are searching for ways to reduce their burden on private parties, farmers and ranchers are likely to come under increased scrutiny for environmental compliance, such as air and water quality standards, including use of wetlands and access to water.

Business environment and market structure: When we talk of the business environment, we must recognize that today's farmers are not simply producers. They are business managers that seek to maximize output, improve quality, minimize costs, and protect against risk. As astute business managers, they follow market trends and consumer demand carefully. For example, some consumers are looking for specific products rather than traditional commodities; value-added products are becoming more common and profitable.

Agriculture, like other industries, is dependent on a reliable and competitive supply of credit. There is no doubt that agricultural lenders will continue to operate in a more fully integrated financial world than in the past. Deregulation of financial markets has blurred historical differences between types of lenders. Capital supplies of lenders are up and they are capable of handling the projected increase in agriculture credit, but this increased demand for credit in a rising interest rate environment will undoubtedly weaken some borrowers.

Lenders need to be cognizant of the structural changes taking place in the agriculture sector in order to provide this sector the financial products and services it needs. The production of many commodities, such as poultry and hogs, has become vertically integrated. It has brought with it production contracts that by-pass traditional spot markets. Given the structural changes in agriculture, we have to ask, if there is a continued shift toward industrial and large-scale agriculture production, what will be the role of the family farmer? With an increasingly bimodal agriculture sector, will small, and part-time farmers be able to coexist with larger commercial enterprises?

The bottom line is that agricultural lenders will be competing for fewer, larger and more sophisticated commercial customers who in turn will be looking for financial products and services that match their evolving needs to manage both production and financial risks. But there will also remain for some years, the financial needs of small and part-time farmers and rural homeowners that need to be met.

FINANCIAL PERFORMANCE ISSUES CONFRONTING U.S. AGRICULTURE

Mitchell Morehart, John Jenkins, Jim Ryan, and Susan Bentley
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Introduction

USDA's baseline analysis presents a long-run scenario for the agricultural sector under current agricultural law, with no shocks and reflects specific assumptions regarding the macro economy, weather, and international developments. These baseline projections provide a means to examine the financial performance of the agricultural sector over the next five years and to identify emerging issues for farmers.

Farm Sector Financial Forecasts for 1995

USDA's December forecasts for 1995 are the starting point for the baseline. The financial performance of agriculture in 1995 is characterized by relatively low net farm income, modest increases in assets, and debt that exceeds \$150 billion for the first time since 1986. Net value added by the farm sector to the national economy is expected to decline in 1995 reflecting lower net income of farm businesses. Selected financial measures for the the 1990-2000 period are presented in table 1.

Commodity Receipts

Livestock cash receipts could fall to their lowest level since 1989. The decline in livestock receipts will be felt most by hog, cattle, and dairy producers. Record 1994

livestock production and a continued outlook for high 1995 production should lead to the second consecutive decline in the livestock prices received index, reaching its lowest levels since 1986.

Higher feed use, relatively low ending stocks, and higher than anticipated export demand should help crop cash receipts approach \$92 billion in 1995. Crop cash receipts are expected to exceed livestock receipts for the second consecutive year, reversing a trend which began in 1985.

Government Payments

Government programs continue to play an important role in price stabilization, supply control, and support of farm incomes in 1995. Relatively low price expectations for corn and other major program commodities following 1994's record production could push direct government payments above \$10 billion. With the exception of 1991 and 1994 direct payments exceeded \$9 billion each year since 1986. Deficiency payments are expected to account for nearly 80 percent of total direct payments in 1995.

Farm Expenses

Cash outlays for production inputs, wages and interest could reach \$144 billion in 1995. Expected low crop prices help livestock

producers by reducing prices for feed and feeder livestock. Farm origin inputs, which represent about 25 percent of total cash expenses, should fall to the lowest level since 1992. The \$12 billion interest expense forecast for 1995 would be the highest since 1990. Interest expense fell each year from 1983 through 1993. The outlook for increased interest payments is due to both rising debt levels and higher interest rates.

Farm Income

Net cash income, which is gross cash income minus cash expenses, is forecast to be \$51 billion in 1995. With the exception of 1994 this would be the lowest level since 1986. Adjusted for inflation, net cash income approaches an all time low. Net farm income is a more comprehensive measure of farm profits that is calculated by adding noncash income, subtracting noncash expenses like depreciation, and adjusting for the value of the change in crop and livestock inventories. This inventory adjustment, which accounts for most of the year-to-year differences between net cash and net farm income, added \$5 billion to the 1994 net farm income forecast and subtracted \$2 billion from the 1995 forecast. The 1995 forecast of \$38 billion represents net farm income levels last experienced in 1988.

Net value added goes beyond net farm income by including not only the income production agriculture generates for farm operators, but also the income it provides to labor, landlords, and lenders. Overall, value added is expected to decline in 1995, largely reflecting lower net farm income. Income accruing to each of the other groups should increase.

The financial performance of the farm sector in 1995 directly affects the farm income of farm operator households connected to the nation's farms and ranches, and the forecast of the farm portion of average farm operator household income is based on the farm sector income

forecast, adjusted for the share of income received by operator households and the forecast number of farms. Many farm operator households, however, also depend on off-farm jobs and income, and the averages are heavily influenced by the vast number of small farms operated by households mainly dependent on off-farm income. In 1995, the average farm income to operator households is forecast at \$4,900, while the off-farm income portion is expected to average \$35,600, for a total farm operator household income of \$40,500.

Farm Business Assets

The value of farm business assets is expected to reach \$930 billion in 1995. Real estate assets, about 75 percent of total farm assets, are expected to rise about 2 percent to \$697 billion. Gains in value per acre will be partially offset by a modest decline in land in farms. Livestock inventory values at the end of 1995 are anticipated to fall by more than \$1 billion to about \$73 billion. The value of crops stored is expected to be around \$24.5 billion, down \$1.5 billion as 1994's large inventories are marketed.

Farm Business Debt

The expected debt increase of \$3-4 billion during 1995 will mark the third consecutive year of rising debt, a cause of concern but not alarm. Debt is a source of capital which can lead to improved productivity and higher profits. The farm debt repayment capacity ratio, which is actual debt as a percentage of maximum feasible debt, helps to gauge the implications of rising debt levels. Increasing

values of this ratio mean that debt is increasing compared with the income farmers have available to service debt. Lower net cash income, rising interest rates, and higher debt could push the farm debt repayment capacity ratio above 55 percent in 1995. This would

represent the highest level of credit utilization since 1986, but is well below the extreme conditions which occurred during the early and mid-1980's. Commercial banks gain in farm credit market share is expected to continue through 1995. Banks share of farm lending will exceed 40 percent, continuing sustained growth from a 22 percent market share in 1982. The Farm Credit System is expected to account for almost one-quarter of all farm lending.

Farm Business Equity

Farm business equity is forecast to rise modestly in 1995, as the increase in value of farm assets exceeds the rise of farm debt. The rate of equity growth is expected to lag the general rate of inflation, so equity, measured in real terms, is expected to decline in 1995. Farm sector equity has recovered about \$210 billion of the nearly \$250 billion of equity eroded during the 1980-86 period. Even so, the 1995 projection for real farm equity of \$600 billion is well below the \$1,140 billion real value for 1979, and similar to real farm equity in 1962.

USDA Baseline Projections

USDA's baseline projections for the financial performance of U.S. agriculture suggest a diminishing government role in agriculture accentuated by growth in export markets (see figures 1 and 2). Cash operating margins tighten over the period with cash expenses representing 76 percent of gross cash income by 2000. The farm sector's relative dependence on debt capital increases, suggesting greater financial risk.

Commodity Receipts

Livestock cash receipts increase 16 percent from 1995-2000. The largest gains are for hogs and cattle. Pork production increases through 1997 followed by a cyclical downturn in

production during 1998. The downturn in production reflects the exit of small independent producers as the trend towards vertical integration continues. Beef production expands over the period, but at a lower rate than population growth. Export demand for high quality fed beef will help farm level cattle prices reach \$70 per hundredweight by 1999.

Cash receipts for crop commodities increase by 12 percent from 1995-2000, an expansion similar to the previous five year period beginning in 1990. Although increasing at a slower rate than for livestock commodities, crop receipts exceed livestock receipts throughout the baseline. In contrast to the general trend of increasing receipts, tobacco and cotton receipts decline from 1995-2000.

Government Payments

The baseline results show a steady decline in direct government payments. By the turn of the century direct government payments account for 3 percent of gross cash income, the lowest level since 1982. With the baseline assumption of an extended Conservation Reserve Program (CRP), payments generally remain in the \$1.7-\$1.8 billion range through 2000 and make up an increasing proportion of total payments. Rising market prices driven by export demand reduce the deficiency payment rate and lead to lower deficiency payments.

Farm Expenses

Total cash expenses grow to \$165 billion by the year 2000, a 15 percent increase over 1995. Some of the larger increases are for manufactured inputs such as fertilizer, fuel, and electricity, all of which increase about 23 percent. Price increases rather than changes in use account for most of that increase. Interest expense also increases 23 percent due to increases in interest rates and outstanding debt. The major farm origin inputs increase less. Cash expense for feed rises just 6 percent

while cash expense for livestock rises 7 percent.

Cash expense increases will not affect all parts of agriculture equally. Farm operators that specialize in beef, hogs, or dairy should have increases of around 13 percent compared with a 20 percent increase for farms that specialize in cotton, wheat, corn, or soybeans. That's because a larger proportion of cash expenses on crop farms is for fertilizer and fuel. In the year 2000 for example, fertilizer is 27 percent of cash expense for corn farmers compared with 7 percent for beef producers. Also, interest tends to make up a higher proportion of the cash expenses of crop farms. By 2000 interest will be between 11 and 12 percent of cash expense on wheat, corn, and soybean farms compared with around 8 percent on beef, hog, and dairy operations.

Farm Income

Net cash income falls to \$48 billion in 1996 then increases steadily through 2000, when it surpasses \$51 billion for the first time since 1995. With relatively small baseline inventory adjustments, net farm income remains in the \$37-\$41 billion range through 2000. While net farm income is 7 percent higher in 2000 than in 1995, net value added is 12 percent higher. This result highlights the role of production agriculture in creating income for participants in the agricultural sector other than farm operators. For example, the income production agriculture generates for farm labor in 2000 is 19 percent higher than in 1995. Lenders receive 18 percent of net value added in 2000 compared with 16 percent in 1995.

The forecast of farm income to farm operator households follows the pattern expected for net cash farm income to the sector, with farm income to households falling from an average of \$4,900 in 1995 to \$4,300 per farm operator household in 1996, then gradually rising through 2005. Off-farm income is the

dominant component of farm operator household income, however, and its dominance is expected to increase. The forecast for average off-farm income, which is based on current off-farm income and changes in the wage compensation index for nonfarm employment, projects modest increases in average off-farm income through 2005. In real terms, average total farm operator household income is expected to increase by 4 percent during the baseline period.

Farm Business Assets

Farm business asset values are expected to rise less than 5 percent over 1995-2000, compared with almost a 10 percent increase during 1990-1995. A decrease in the appreciation of land values from almost 14 percent over 1990-1995 to less than 4 percent over 1995-2000 is the principal cause for the more modest growth in total farm assets. While the rise in real estate asset values moderates, nonreal estate assets grow almost 8 percent, compared with an increase of 6 percent during 1990-1995. Projected increases in livestock and crop inventory values drive the rise in nonreal estate asset values. Higher prices could increase the value of livestock inventories by almost 16 percent, and the value of crop inventories by almost 18 percent. The growing proportion of assets in inventories should improve liquidity of the sector. A favorable liquidity situation can help to stabilize cash flows and reduce income variation.

Farm Business Debt

Total farm business debt is projected to rise almost 10 percent over 1995-2000, slightly less than the increase during 1990-1995. Despite the modest projected rise in farmland values, farm real estate debt is expected to increase more than 7 percent during 1995-2000. Expected changes in total farm business debt reflect changes in the composition of farm assets, with the largest increase (over 12

percent) occurring for nonreal estate debt. Despite the forecast of rising interest rates, bank lending to farmers and financing by input suppliers and other nontraditional lenders is expected to continue to contribute to the growth in nonreal estate debt.

Farm operators use of credit is not expected to place excessive demands on their ability to service debt. A projected increase in the farm sector debt-to-asset ratio from 16.3 in 1995 to 17.1 in 2000 reflects the increase in debt relative to the change in asset values. This rise in average indebtedness does not appear to be beyond the ability of the sector to repay. Farm operators use of debt repayment capacity, which compares actual debt to that supportable by current income, is projected to rise from 56 percent in 1995 to almost 62 percent during 1996-1998, and then decline to about 60 percent in 2000. The debt-to-asset ratio bears monitoring for further increases. These would represent growing financial risk in the sector, at a time when diminishing availability of government support and greater reliance on market forces will also be increasing farm operators' production and price risk. Insurance, hedging, forward contracting, and integration may gain in importance as means of reducing or spreading agricultural risks.

Farm Business Equity

Farm business equity is forecast to rise about 4 percent over 1995-2000, compared to an increase of over 9 percent during 1990-1995. In real terms, equity is projected to decline throughout the period, as the rate of growth in equity is expected to lag the general rate of inflation. The decline in real equity also reflects those forces driving agriculture to improve coordination through contracting and integration. Nonfarm participants are becoming more involved in the financial structure of the sector. These participants will gain ownership of a greater share of the

productive assets and equity of the sector, as well as a growing share of the net income it generates.

Financial Performance Issues Confronting Farmers and Ranchers

The availability of high quality, affordable food and welfare of farm people were the primary criteria used by society to evaluate the structure of agriculture early in this century. These issues were fundamental to establishing the role and scope of government intervention in the agricultural sector. Over time the focus of society has shifted to other characteristics of agriculture such as the efficiency of resource use, contribution to national growth, environmental stewardship, relationship to rural communities, and responsiveness to changing consumer preferences. Given the agriculture structure implied by the baseline results and society's focus on these elements, some emerging issues that will affect financial performance of production agriculture can be characterized as cost containment, risk management, industrialization, and rural community linkages.

Cost Containment

As operating margins tighten, reductions in per unit costs of output will be necessary to compete in world markets (see figure 3). Even with modest productivity gains, there will be greater pressure to increase farm size in order to spread costs over more units of output. The availability and adoption of technological advances has been an important factor in reducing per unit costs of production. In a more competitive, market orientated agriculture, information diffusion regarding new technologies becomes crucial to the adoption process. Even more important to cost containment is the inherent ability of operators to adopt both management and capital intensive technologies and the extent of adoption.

Despite output enhancing, cost reducing impacts of technological developments, expenses for certain operating inputs such as water and fertilizer and fixed expenses like interest are expected to pose continuing cost containment problems, particularly for those larger operations for which these items are now a significant component of total costs. Upward pressure on operating costs of livestock operations will not come from traditional sources such as feed. For these operations, compliance costs with environmental regulations may present the most significant challenges for cost containment. Farm operators may face new expense sources such as costs associated with information discovery and implementation of risk abatement strategies.

Risk Management

Greater dependence on market outcomes coupled with declining government support represents a substantial change in the environment faced by farmers making business and financial decisions. Farmer's ability to manage business and financial risk and balance the tradeoffs among various production, marketing, and financing decisions will have a more significant impact on the financial success of their business.

There are several sources of business risk for the farm operator. Probably the most significant and recognizable are production and price risk. Production risk represents the random variability in the production process associated with unusual weather events, pest damage, and other unanticipated casualties. Price risk represents the fluctuations in both prices paid for production inputs and prices received for commodities produced. As agriculture gains a stronger market orientation, risk management strategies which have traditionally placed more emphasis on production such as diversifying commodity enterprises will move towards developing

marketing responses to sources of price risk (see figure 4).

Even with coordinated risk management strategies to deal with production and price risk, increased variability of market prices will require that producers place more importance on management of financial risk. The level of financial risk depends on the relative importance of debt and equity financing. Commercial lenders often adjust interest rates to reflect the borrower's creditworthiness. Additional non-price methods of managing credit risk include adjustments in collateral requirements, downpayments, maturities, and repayment schedules. Farm creditors, through collateral based lending policies in the early 1980's, not only contributed to the rise in financial risk in farming, but transferred a share of that risk to themselves, as evidenced by the estimated \$20 billion in lender loan losses during 1984-1989. Lending policies today emphasize the ability of the borrower to meet loan service requirements from current income. Such policies reduce lender exposure to the financial risk of farming, and, by limiting the maximum credit available to any borrower, reduce farm operator financial risk as well.

The agricultural production sector today is evolving along three parallel lines that require individual consideration of creditworthiness and financial risk: large commercial size farms operated independently by one or more farm families, the industrialized component with its varying forms of vertical coordination, and the large number of small, part-time, or limited resource farms that depend on off-farm income. These emerging farm structures face distinct financial risks and credit needs.

Industrialization of U.S. agriculture will affect the financial risk exposure of farmers as they seek to acquire the least cost financing for their operations. Vertical coordination through contractual arrangements and integration

provides alternatives for access to capital, and allows a spreading of financial risk from farm operators to input suppliers, processors, and other nonfarm participants in agricultural production.

Constraints to Continued Expansion of Industrial Agriculture

Improved coordination between farm operators and other participants in the food and fiber sectors will increase with rising economic pressures to contain costs and manage risk. The continued expansion of industrial agriculture will result from economies of scale to be achieved through vertical and horizontal integration. Increased coordination is evidenced by the rising use of production and marketing contracts, and the increasing degree of coordination between contractors and contractees (see figure 5). Such contracts range from market-specification contracts, which require only that a predetermined quantity of a certain quality product will be delivered, to production-management contracts, which impose specified input usage and management practices on the contractee, to resource-provision contracts, where the coordinating firm supplies inputs, including financing, and the contractee performs the tasks necessary to meet production standards and quotas. In improving coordination between market participants, such contracts allow farm operators to minimize costs and spread risks. Environmental constraints to continued industrialization through integration maybe significant. As hog operations apply the poultry production model, there is increasing local concern over the environmental impacts of large concentrated hog populations on surface and ground water quality. Many local jurisdictions now require public hearings before hog operations can expand beyond a certain size.

Linkages to Rural Community Resources

Farm operators are now participants in the local, regional, and national economies. Off-farm income is the dominant component of farm operator household income, accounting for 88 percent of farm operator household income in 1995. By the turn of the century, farm operator household income is expected to average almost \$50,000, and nearly 90 percent is expected to derive from off-farm sources. Dependence on off-farm sources of income, however, varies widely. For example, the share of income from off-farm sources decreases with farm size. Households with operators reporting farming as their major occupation depend less on off-farm income than households with operators reporting another major occupation. Groups that currently depend more heavily on farm income are likely to continue this dependence into the next century.

Nevertheless, farm households as a whole depend heavily on off-farm income, and most farm households receive at least some off-farm income. Off-farm income is crucial to the economic-well being of operator households. Results from the 1993 Farm Costs and Returns Survey (FCRS) indicate that about a third of all operators reported they were somewhat dissatisfied or very dissatisfied with their farm income, a much higher share than for the other sources of income. Yet, 87 percent of operators were satisfied with their standard of living, which implies that other sources of income make up for less than satisfactory levels of farm income (see figure 6).

The well-being of participants in the farm sector will continue to depend on the ability of rural communities to provide jobs and services. In the absence of improved rural job prospects, population loss will continue in more isolated rural areas. As an example of the losses that can occur, consider events of the 1980's in the 556 counties defined as farming-dependent,

which are heavily concentrated in the Great Plains. About 69 percent of these counties had declining employment between 1979 and 1989, and population change in the counties averaged -6.9 percent between 1980 and 1990.

Data System Needs

Traditional data collection procedures will have to adapt in order to accurately reflect the complexities of modern agriculture. To properly measure farm operator household income, analysts need information about the asset ownership and flows of income to asset owners. It is no longer appropriate to assume that the farm business and the farm operators household provide all capital used in production. A variety of people, households, and other provide inputs and share in the farm businesses profit or losses.

Given expectations for the continued industrialization of agriculture, how do our data systems measure up? ERS has revised its surveys of individual farmers to obtain data on contractual arrangements, and the shares of income going to and expenses being paid by contractors and integrators. We identify how many households share farm business income and the amount that operators themselves earn from their farms.

Since nonoperator landlords and contractors or integrators are not surveyed directly, we do not obtain data on the value of the assets they control that properly should be considered farm business assets, nor do we have data on their debt levels. As these participants contribute more equity to production agriculture it will become increasingly important to have reliable measurement of capital stock and flows.

Table 1--Selected farm sector financial measures, 1990-200p

	1990	1991	1992	1993	1994F	1995P	1996P	1997P	1998P	1999P	2000P
Billion dollars											
Cash receipts	170.0	168.8	171.2	174.6	176.3	177.0	177.6	182.3	188.6	195.3	202.0
Crops	80.1	82.1	84.9	84.5	88.7	91.8	91.6	94.0	97.3	100.3	103.1
Livestock & products	89.8	86.7	86.3	90.1	87.6	85.1	86.0	88.3	91.2	95.0	99.0
Farm-related income	7.6	7.8	7.8	8.8	8.0	8.2	8.5	8.7	9.0	9.3	9.6
Government payments	9.3	8.2	9.2	13.4	8.0	10.2	8.6	8.3	7.5	6.8	6.2
Gross cash income	186.8	184.9	188.2	197.2	192.4	195.3	194.7	199.3	205.1	211.4	217.9
Cash expenses	131.8	131.7	130.8	138.7	142.7	144.1	146.6	150.5	155.5	160.4	165.4
Net cash income	55.1	53.2	57.4	58.5	49.4	51.2	48.1	48.8	49.6	51.0	52.5
Value of inventory change	3.4	-0.3	4.3	-3.6	5.3	-1.5	0.4	0.3	0.4	0.5	0.3
Non-money income	8.0	7.7	7.8	7.9	8.1	8.1	8.3	8.5	8.6	8.8	9.0
Gross farm income	198.2	192.3	200.2	201.4	205.8	201.9	203.4	208.1	214.1	220.7	227.2
Noncash expenses	16.8	15.5	15.2	15.4	15.6	15.7	15.6	15.9	15.9	16.3	16.6
Operator dwelling expenses	4.1	4.0	4.1	4.0	4.1	4.2	4.3	4.3	4.4	4.4	4.5
Total production expenses	151.3	151.2	150.1	158.0	162.4	164.0	166.4	170.7	175.8	181.1	186.5
Net farm income	46.9	41.1	50.1	43.4	43.3	37.9	37.0	37.5	38.3	39.7	40.7
Net value added	81.9	74.5	83.0	76.9	78.2	73.9	74.4	75.0	78.0	80.6	82.9
Farm assets	848.3	842.2	860.8	888.0	920.1	930.0	943.8	950.7	959.5	966.4	976.0
Farm debt	137.4	138.8	138.6	141.9	148.1	152.0	155.3	157.7	160.7	163.4	166.7
Farm equity	710.9	703.6	722.2	746.1	772.0	778.0	788.5	793.0	798.8	803.0	809.2
Percent											
Debt/equity ratio	19.3	19.7	19.2	19.0	19.3	19.5	19.7	19.9	20.1	20.4	20.6
Debt/assets ratio	16.2	16.5	16.1	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1

F = Forecast. P = Preliminary. Numbers may not add due to rounding.

Figure 1
Real Value of U.S. Agricultural Exports

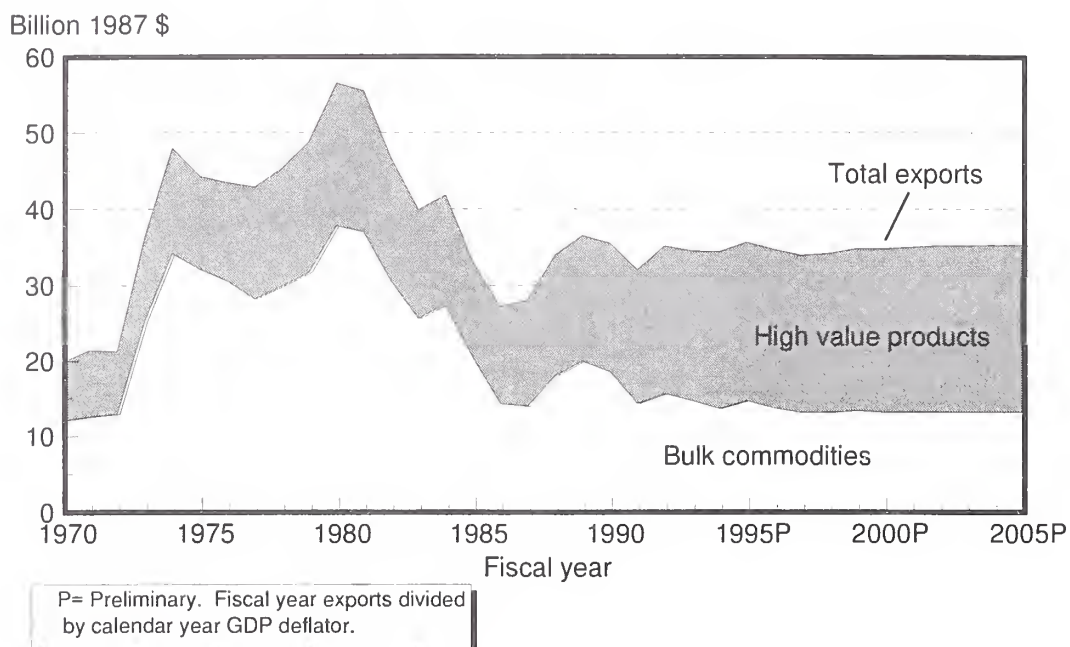


Figure 2
Real Value of Direct Government Payments

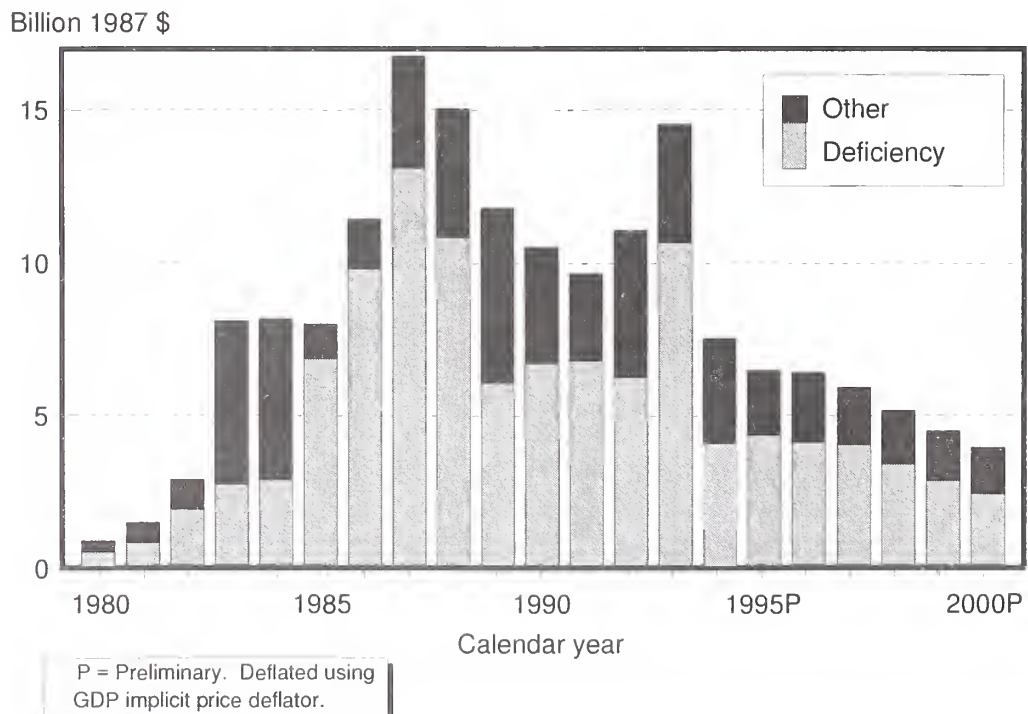


Figure 3
Cash operating margins are expected to tighten in production agriculture

Cash expenses/
gross cash income

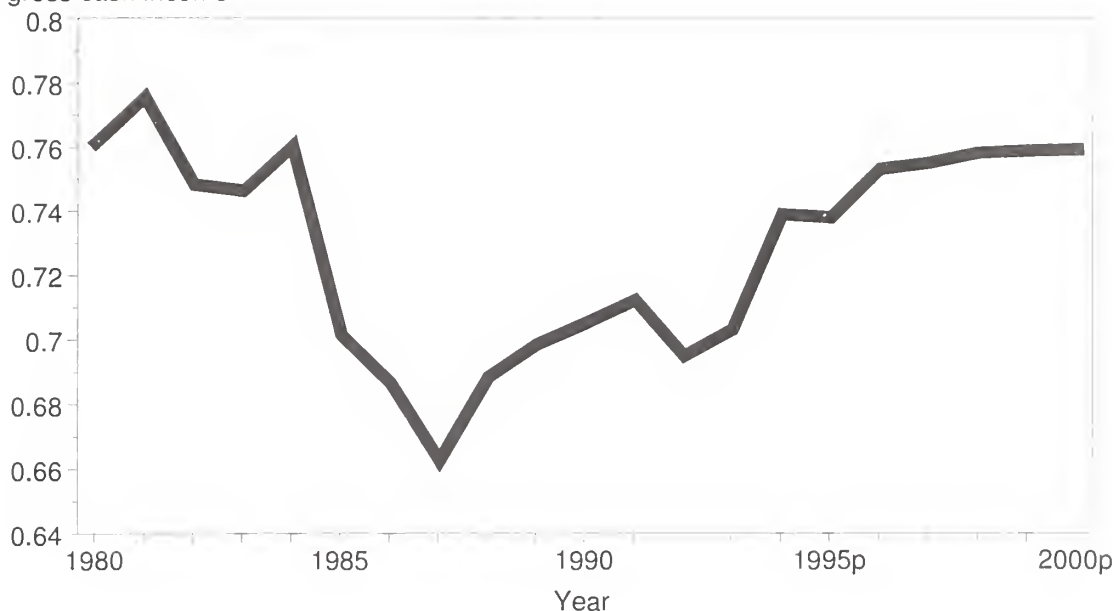
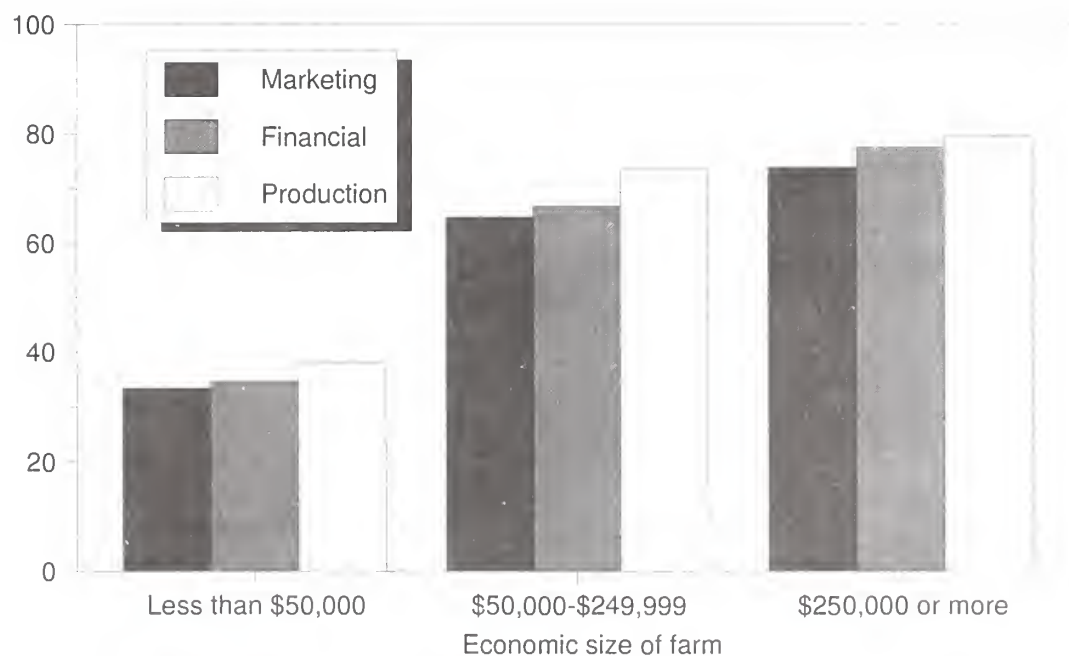


Figure 4
Larger farm operations were more likely to use risk management strategies, production risk received most emphasis

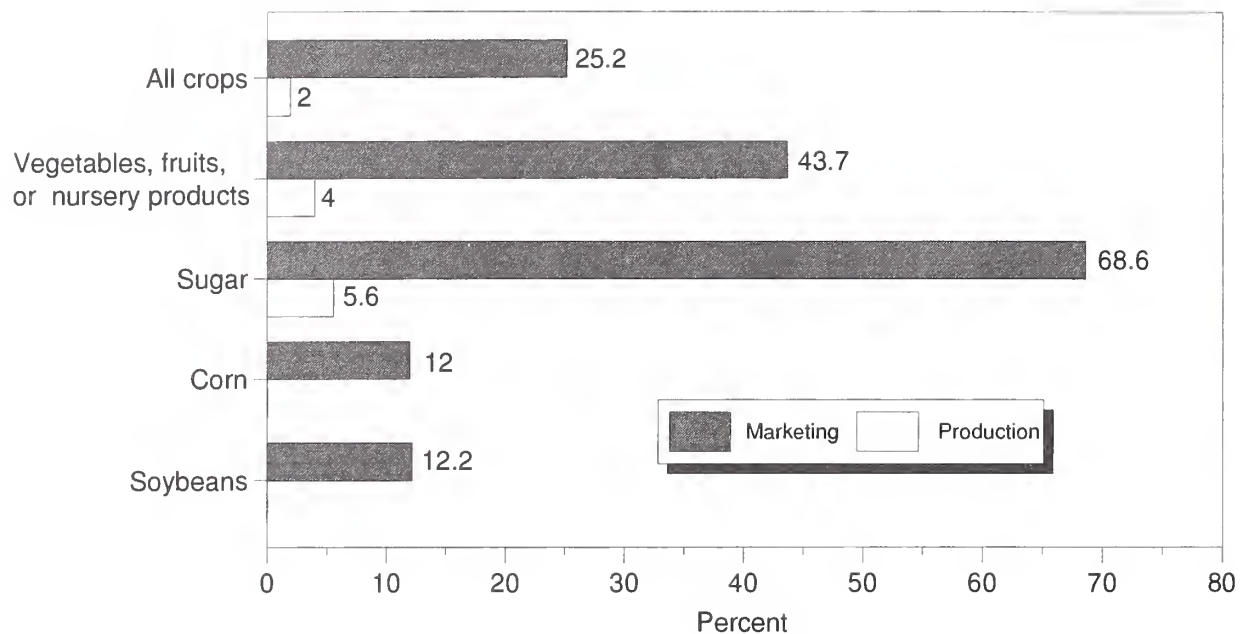
Percent



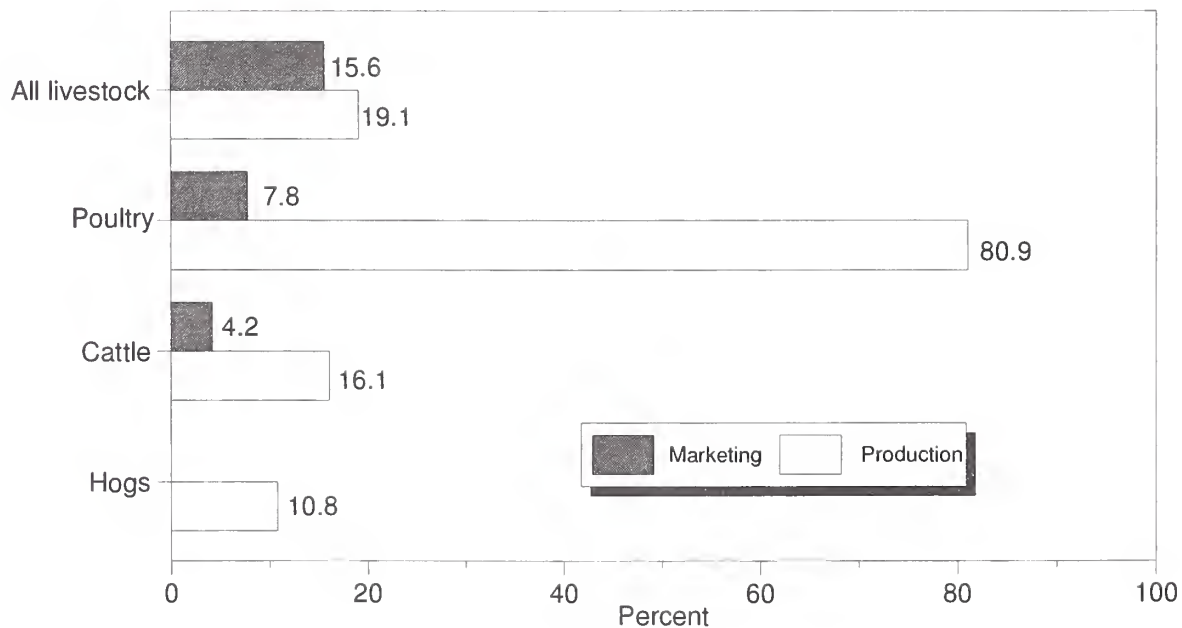
Source: 1993 Farm Costs and Returns Survey, USDA.

Figure 5
Relative significance of crop and livestock contract arrangements, 1993

One-fourth of the total value of crop production was marketed under contract in 1993



Production contracts are more common for livestock commodities, over 80 percent of the total value of poultry was produced under contract in 1993

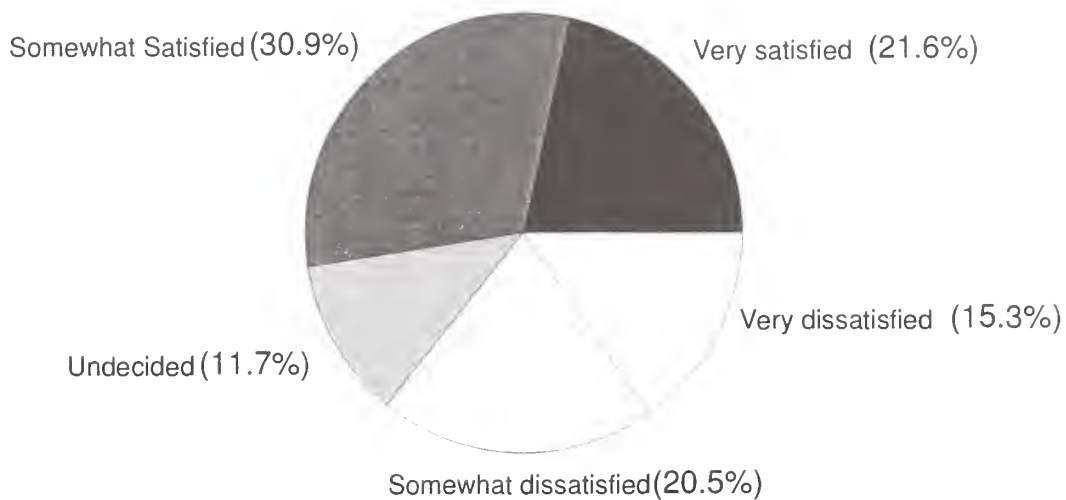


Source 1993 Farm Costs and Returns Survey, USDA.

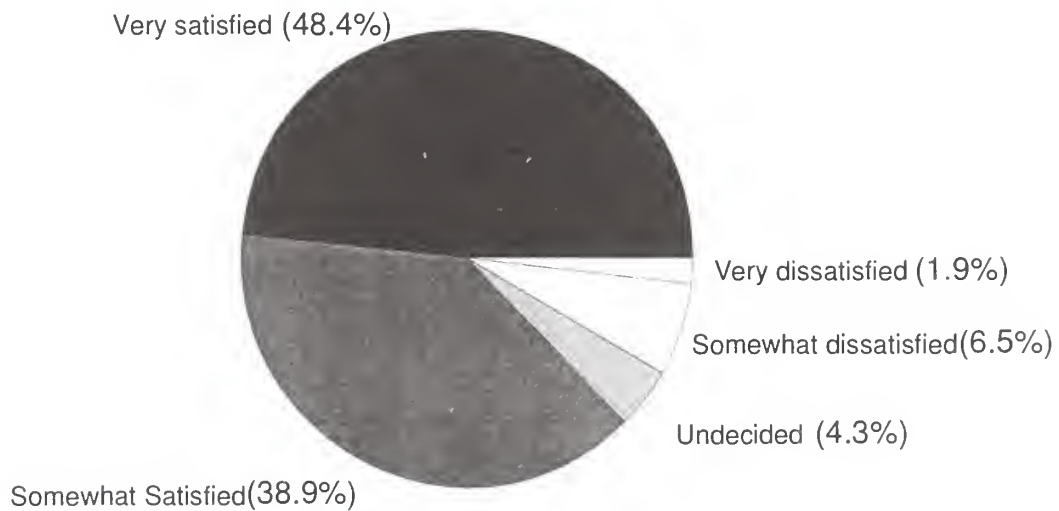
Figure 6

Farm Operator Satisfaction with Aspects of Farming

More than one-third of farm operators were dissatisfied with farming as a source of Income, but...



Most farm operators were satisfied with their standard of living



Source: 1993 Farm Costs and Returns Survey, USDA.

MANAGING BUSINESS AND FINANCIAL RISK IN A CHANGING ENVIRONMENT

Cole R. Gustafson

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Risk in the agricultural sector is rapidly shifting due to increasing global competition, declining federal farm commodity payments, implementation of crop insurance reform, expanding environmental and resource concerns, industrialization of the food chain, and adoption of new biological/production technologies. Farm operators, landowners, other equity stakeholders, and consumers will need to adjust to this new environment.

The following discussion delineates adjustments that these entities are now making in the Northern Great Plains. Their complex responses include combinations of new information processing techniques, increased levels of contracting and diversification, and reduced financial leverage. From an outlook perspective, inter-year agricultural production will stabilize--although the risk of catastrophic losses increases. Farm incomes will adjust upward to compensate labor and capital resources for additional risk.

Farm Operator Responses

Farmers in the Northern Great Plains received numerous benefits from federal commodity, disaster, and crop insurance programs over the past decade. Enrollment of eligible acres in these programs is the highest of any region in the country. The risk protection afforded by these programs reduced farmers' incentives to experiment with new crops/crop rotations, encouraged them to farm marginal land that otherwise would remain idle, promoted overinvestment in farm real estate (due to capitalization of subsidized returns), and led farmers to underinvest in new production technologies.

The reality of decreasing federal farm program benefits is causing several reactions among farmers. First, decreasing risk protection is tempering farmland investment. Increasing numbers of farmers are expanding their farm businesses through renting and leasing, as opposed to direct farmland ownership. Over the past decade, the ratio of farmland rent to value has steadily increased from 6.7% to near 9%. As a consequence, leverage (stemming from real estate financing) will continue to decline. From a risk perspective, they are striving to insulate themselves from future asset price variations--especially farmland price declines.

Reform of federal crop insurance will increase the risk exposure of Great Plains farmers. Although the new program provides greater flexibility and enables custom tailored insurance policies that meet specific needs of individual farmers (through subsidized additional

coverages provided by private vendors), the cost of total coverage (base plus additional) exceeds the cost of similar protection afforded by the past program. Thus, most farmers are going to purchase less insurance and face greater crop risk. Given available policy options, farmers can almost fully guarantee both the price and yield of their crops, but residual profit after premium deductions is minimal.

To compensate for lost farm program income and risk protection, farmers are significantly expanding the scale and scope of their farm businesses. New minimum tillage and air seeding technologies, coupled with crop rotations involving more diverse commodities, are facilitating the transition to larger farm acreages. To overcome timeliness constraints, farmers are expanding their operations into neighboring counties and states. Large-scale farmers are specializing in areas where they have comparative expertise and hiring consultants/custom farm operators for remaining tasks. Increased irrigation, adoption of improved genetic stocks that are resistant to adverse conditions and chemicals are reducing production risk.

In addition, farmers are rapidly establishing liaison relationships with related firms in the food chain (industrialization of ag) and exploring new processing opportunities (value added initiatives) ranging from the processing of wheat straw into plywood and paper to the exporting of bison meat to England. North Dakota is a "hot bed" of activity at the present. The goal of these activities is to reduce "market margin" and increase "profit margin". These liaisons allow farmers to pass yield and price risk to other parties. Income losses to farmers who join these ventures (from having to share profits with other coop members and administration) are being offset by the output and quality increases realized through adoption of new production technologies that are being disseminated to co-op members.

The highly standardized production processes being adopted by farmers will result in a more consistent supply of uniform agricultural products to consumers. Increased use of consultants reduces the likelihood of managerial mistakes leading to production shortfalls. The diversification of enterprises and addition of value-added products will increase and stabilize farm incomes. Labor and technology-based inputs will capture a larger proportion of the economic rent generated in agriculture.

The greatest risk facing vertically-integrated and value-added farms is contract failure. Instances of this failure are unavoidable and the consequences severe.

Equity Stakeholders

Resource ownership in the agricultural sector will gravitate from farm operators to other parties. The large size of future farms coupled with low current incomes precludes many farm operators from resource ownership. Resources (primarily farmland) will be held by parties other than farm operators. Farm operators will gain control of the resource through lease and rental arrangements. As a result, the financial position of farm operators will be

more stable over time as each new generation does not have to "re-capitalize" the business. Financial risk then shifts from farm operators to other equity owners.

Of any group, farmland owners face the greatest downside risk due mainly to declining federal commodity payments that are already capitalized in farmland values. Moreover, continued adoption of new technology will also pressure farmland prices. As other inputs become more important in agricultural production processes, proportionate returns to farmland investment decline.

Equity investors in new agricultural technologies, ranging from industrial animal production units to biological crop enhancements, will increase in number. These investors will require compensation on their risk capital commensurate with existing opportunities in the financial marketplace. Securities attached to these investments will be well-received because existing financial data indicates considerable opportunity for diversification.

Consumers

Even though existing farm programs designed to provide American consumers with plentiful and relatively cheap foodstuffs begin to unwind, the eventual impact on consumers will be slight. Risks of food shortages into the future will be mitigated by agricultural industrialization that standardizes and stabilizes system throughput, continued adoption of new yield-enhancing technology, and international trade agreements that improve food reallocation in periods of need.

Society as a whole though faces increased catastrophic risk due to a increased reliance on specialized technology and a narrowing of genetic stock in the food chain. For example, premium swine genetics primarily originate from England at the present. If this generic stock becomes limiting, existing research (and eventually production) would have to be based on other material that is quite inferior. Consequently, production could fall dramatically.

**THE INDUSTRIALIZATION OF U.S. AGRICULTURE:
IMPLICATIONS FOR FINANCIAL PERFORMANCE AND FINANCING**

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Industrialization has rapidly taken the stage of public attention and debate in the past few years. The subject is not a new one. Indeed, the industrialization of the broiler industry some thirty years ago led a few observers to label similar, more contemporary trends in other agricultural industries, "broilerization." What has propelled industrialization to the center of the agricultural stage more recently is an apparent acceleration in its development and its new inroads into midwestern agriculture, industry segments such as grains and pork that have long been viewed as quintessential commodities produced on family farms.

By changing the way that agriculture does business, industrialization will carry enormous implications for the structure of the industry, for its financial performance, and for its financing. Industrialization will raise new questions about the information flows that we have traditionally monitored. By changing the roles of producers and processors, industrialization will redefine the sector's financial flows. And through new financial relationships, industrialization will redirect the flow of capital.

In my remarks today, I will examine three issues. First, I will explore where industrialization seems headed. Second, I will analyze how industrialization may redefine how we measure the sector's financial performance. And third, I will discuss how industrialization may redirect the sector's demand for and sources of capital. I will conclude that industrialization will ultimately lead to fundamental change in many traditional sources of information on the sector.

WHERE IS INDUSTRIALIZATION HEADED?

Nearly four years ago, we coined the term "quiet revolution" to describe the trend to more vertical coordination in U.S. agriculture. Though the trend is still very much a revolution, it is no longer so quiet. Indeed, the new approach to agricultural products and market relationships is spawning a raucous debate across the countryside. With the

debate heating up, it is useful to define industrialization and examine why it is occurring.

Industrialization has become the most widely used name for this revolution. What exactly is meant by industrialization? Though many changes fall under the term, two stand out as defining features. First, industrialization brings a shift from food *commodities* to food *products*. Second, it leads to a shift from spot auction markets to more direct market channels, such as production contracts.

Why is industrialization happening? At root, it is the result of two powerful forces--a new consumer and a new producer--and the impact these two players have on the markets where they meet (Barkema). The new consumer is a highly demanding sort. The new producer, meanwhile, is armed with prodigious new technologies that increasingly permit food to be engineered from farm, to processor, to consumer. A more demanding consumer and a more capable producer would seem to be a match made in heaven--and it is to a considerable degree. There is one difficulty, however, and that is the general nature of agricultural markets and the market institutions where consumers, producers, and processors meet. Historically, bulk commodities have flowed through commodity markets to food processors, who in turn have marketed standardized products to consumers. But consumers now want tailored foods, and to ensure that they get them, processors want more specific farm products.

In response, processors and producers in many segments of U.S. agriculture have gone around traditional spot markets to more direct market channels. These end runs range from market contracts to outright ownership, or complete vertical integration. This trend was first established in broilers and vegetables, but more commodities have moved in this direction over the past three decades. The move to production contracts and vertical integration is not happening evenly across agriculture, but the past three decades have brought quite a bit of change. Broilers were almost completely "industrialized" thirty years ago, and grains still resist the trend. Today, products where production contracts or direct ownership account for more than half of all production include: vegetables (both fresh and processed), citrus fruit, potatoes, sugar, seed crops, eggs, fluid milk, broilers, and turkeys.

What lies ahead for industrialization? What changes is industrialization likely to bring? Overall, I expect the pace of industrialization to quicken, due both to technology and economic forces. Change will come first to the livestock industry, where the hog industry is already well on its way to being "industrialized." Cattle feeding is probably next, although ranching may never be industrialized, simply because there are too many people for whom ranching is mostly a way of life and for whom market incentives are not decisive in business decisions. Crops will also move toward industrialization, although much will depend here on the future direction of commodity programs. Cuts in these programs would make "government contracts" less attractive to growers. While only a small percentage of the nation's major grain crops are produced under contract to

private firms, the vast majority *are* grown under contract. It just happens that the contractor is the federal government and commodity programs are the marketing vehicle. Moreover, geneticists seem likely to unlock more special-use grains--a development that will almost certainly encourage identity-preserved products.

Industrialization will bring a further polarization to agriculture. Increasingly, the nation will have two agricultures. Even though industrialization is advancing at a faster rate, it does not follow that commodity agriculture is over and done with. One can think of commodity agriculture as the "sea" that covers most of the farm belt. But emerging out of this sea will be an ever-increasing number of islands of specialized production outside traditional markets. Some of the islands will be big, such as the pork industry, while others will be small, such as white corn for corn chips. The big difference between these two agricultures will be profit margins. Commodity agriculture will be low margin, and producers and processors will operate at low cost and high volume. The islands of specialized production will be more profitable, because more value is added. The question will be how the profits are divided between producers and integrators.

INDUSTRIALIZATION AND ASSESSING FINANCIAL PERFORMANCE

Many people are interested in the financial performance of U.S. agriculture--farmers, policymakers, agribusinesses, and agricultural lenders, just to name a few. Because the financial performance of the sector has such broad interest, the U.S. Department of Agriculture has long maintained a series of sector financial statements. As industrialization continues, these traditional measures of financial performance will lose their precision, not because department employees are any less diligent but because old measures will not accurately assess a new industry. Thus, some hard choices lie ahead on *what* information is most useful and *how* to collect it.

What to measure?

Industrialization is redefining the way agriculture does business, and in so doing, is redefining farms. Traditionally, the farm sector financial statements have measured the financial performance of farms. But what is a farm under industrialization? Is the contract grower a farm? Is the contract processor a farm?

Whose performance do we want to measure? By default, it may be necessary to think about the entire food system because the lines that used to separate the various stages of production are blurring. Historically, agriculture was a well-defined series of steps, each separated by a market. Monitoring transactions and prices in those markets told a lot about the performance of the industry. Today, industrialization is blurring the lines separating stages of production, and in some cases removing them altogether. Thus, in a vertically integrated hog operation the traditional "market" price for hogs is gone altogether. What the firm cares about is the price of corn, the price of breeding

stock, and the value of the cutout at retail. The value of the grown hog moving across a scales is merely a shadow price with little decision value to the firm.

How to measure?

Equally difficult may be the matter of securing good measures of farm sector performance. After wrestling with what a farm is, the next problem will be to decide how to acquire information from firms that increasingly view their financial decisions as proprietary information. Industrialization is leading to bigger farms and bigger processors. They will both be reluctant providers of financial information. The problem will carry over to price information. The public may continue to have an interest in monitoring farm prices, whether they are market or shadow prices. But discovering the shadow prices will be extremely difficult.

INDUSTRIALIZATION AND TRACKING CREDIT FLOWS

Just as industrialization will make it more difficult to assess financial performance, it will also make it more difficult to track the sector's financing. Industrialization is characterized by the emergence of large "integrator" firms. In some cases they are input providers, in other cases they are processors, and in still others they might be retailers. Through the course of the 1980s, many of these firms have become bigger (mainly through consolidation) and broader (more diverse line of products).

These firms are capital intense and thus must be adept at managing their risks. Staring at the consumer with one eye and at Wall Street with the other, these firms see industrialization as an effective way to manage risks that are greater and more complex. Industrialization can reduce many types of risks. It reduces supply risk by assuring a steady flow of food inputs. It reduces quality risk by guaranteeing consistent, trait-specific products. It reduces financial risk by reducing the variability in input prices.

A final, key feature of these integrator firms is that they have ready access to capital markets. Whether or not they are publicly traded firms, they usually have quick access to commercial paper and bond markets in addition to syndicated lines of credit. The access of integrator firms to capital markets extends to greater and lesser degrees to the producers with whom they contract. In many cases, the integrator provides operating capital. In other cases, they may provide financing for production facilities and equipment.

Such new credit channels raise new questions about our traditional means of tracking credit flows in the sector. Clearly, data on commercial banks, the Farm Credit System, life insurance companies, and the Farmers Home Administration no longer provide a complete picture of agriculture's credit demands or sources. The problem, of course, is that rounding out the picture will be quite difficult.

Agricultural credit that stays with traditional lenders may migrate toward larger lenders. Industrialization will have the effect of reducing amount of marketing risk that a farmer faces. At the same time, however, it will increase the "relationship" risk. That is, the value of the farm loan will depend critically on the performance of the contractor. Because these contractors will generally be large, complex companies, the task of evaluating the financial quality of the relationship will be difficult. Large farm lenders who can devote special staff to analyzing such risk will have a clear advantage over small lenders.

CONCLUSIONS

Industrialization will continue apace in U.S. agriculture as fundamental economic forces push the industry toward more vertical coordination. Industrialization will increasingly divide agriculture into a "sea" of commodity production and "islands" of specialized contract production. The lowering of the government safety net under agriculture will hasten the emergence of more islands, even in traditional bastions of commodity production like the Corn Belt.

By changing the way agriculture does business, industrialization will also change the way we view the financial performance and financing of agriculture. Defining the "farm sector" is not easy when the lines between farms and processors blur, or even go away. Moreover, obtaining financial information from large firms or their contractees will be difficult. Finally, integrator firms that figure prominently in industrialization have ready access to capital markets, providing new sources of capital to farmers. New credit flow information is needed for a complete picture, but again will be difficult to acquire. Among traditional farm lenders, industrialization may favor large lenders over small ones due to the added cost of evaluating relationship risk.

The views expressed are strictly those of the author and do not necessarily represent those of the Federal Reserve Bank of Kansas City or the Federal Reserve System.

LINKAGES TO RURAL COMMUNITY RESOURCES: IMPLICATIONS FOR THE FARMER'S LIVELIHOOD

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As we discuss farm income and farm finance issues, it is important to recognize the critical role that nonfarm income plays in the livelihood of farm families. While the growing interdependence of agriculture and rural communities has been recognized for some time (Korsching and Gildner 1986, Leistritz and Ekstrom 1986), a recent report from the Economic Research Service, USDA provides detailed information about the income sources of farm households (Ahearn et al. 1993). Using data from the comprehensive Farm Costs and Returns Survey, these researchers found that the average income of farm operator households was \$39,007 in 1990, compared to \$37,403 for all U.S. households. However, only about 15 percent of farm households' income came from their farms. Off-farm income was the major income source for most farm operator households. The average off-farm income in 1990 was \$33,265 or 85 percent. Preliminary data for 1991 and 1992 indicate that the tendency for off-farm income to be the major income source for farm households has continued. Off-farm income accounted for 84.5 percent of farm household income in 1991 and 83.3 percent in 1992.

Salaries and wages from off-farm employment were the largest source of off-farm income for farm operator households--\$17,174 per household or 52 percent of off-farm income in 1990 (Ahearn et al. 1993). About 58 percent of the farm operator households reported income from this source. Off-farm business income was the second largest source of off-farm income--\$7,604 or about 23 percent. However, only about 17 percent of farm households reported income from this source. Overall, about 44 percent of farm operators reported that something other than farming was their major occupation. This percentage went up to 58 percent for farms with sales of less than \$50,000. For all farm classes with sales over \$50,000, over 90 percent reported that farming was their primary occupation.

Because of the diversity of the U.S. farm sector, industry-wide averages can be deceptive. Farm income, which accounted for only 15 percent of farm income overall in 1990, was about 78 percent of household income for farms with annual sales of \$500,000 or more, 67 percent for farms with sales of \$250,000 to \$499,999, and 43 percent for farms with sales of \$50,000 to \$249,999. However, farms with sales of less than \$50,000 recorded negative net farm incomes, on average, indicating that farm

receipts were inadequate to cover production expenses. This last group of farms accounted for almost 72 percent of all farm operator households, but only 11 percent of the total value of farm production.

The importance of off-farm employment and off-farm business income to the livelihood of a high percentage of farm families points out the critical interdependence of agriculture and other sectors of the rural economy. Several decades ago, trends of farm mechanization and consolidation made it clear that economic diversification would be essential in order to maintain the viability of many rural communities. Today, it is increasingly clear that a healthy nonfarm economy is essential to the livelihood of many farm families as well.

While we have seen that national statistics regarding farm household income are affected substantially by the 72 percent of the nation's farms that have annual sales of less than \$50,000, off-farm employment and business involvement are becoming more important to farm households in areas dominated by family and commercial scale farms. For example, North Dakota is a state where more than 80 percent of farm operators regard farming as their primary occupation, the highest percentage in the North Central region (Korsching and Gildner 1986). However, in recent years an increasing percentage of farm households in our state have become involved either in off-farm employment or in nonfarm business activities or both.

A series of farm household surveys conducted between 1985 and 1990 document the increase in off-farm employment in North Dakota. In 1985, about 24 percent of a statewide panel of farm operators reported that they had worked off the farm during the past year, while 31 percent of the spouses in the households surveyed had worked at off-farm jobs. By 1990, the percentage of the operators in our panel who were working off the farm had grown to 29 percent, while about 42 percent of the spouses in our panel were working at off-farm jobs. The financial stress that many farm households experienced during the 1980s was clearly one of the factors that encouraged the increase in off-farm employment (Leistritz et al. 1986).

A second factor that has facilitated the off-farm employment of North Dakota farm families in recent years is some new development initiatives that have been bringing new jobs to rural areas. In particular, a number of producer groups in our area have organized cooperatives in order to engage in further processing of their products. The sugarbeet coops in the Red River Valley are the best established of this group. Recent initiatives include (1) Dakota Growers Pasta Company, with a plant near Carrington, ND that employs 220 people and (2) a proposed \$260 million corn wet milling plant scheduled to begin construction in the spring of 1995.

While agricultural processing and other forms of manufacturing have long been a mainstay of rural economic development efforts, advances in telecommunications technology have opened up some new development possibilities for rural areas. Over the past few years, increasing numbers of urban-based firms have found that they can advantageously locate certain types of data processing, telemarketing, and

other back-office operations in nonmetro locations. Some recent examples of telecommunications-linked businesses that have chosen nonmetro locations in North Dakota include (1) in-bound telemarketing, including a major hotel reservation center that employs about 360 during the peak season, (2) out-bound telemarketing, and (3) data and claims processing (Leistritz 1993). These firms have added another dimension of employment opportunities in many rural communities in North Dakota, as well as other parts of the Upper Midwest.

In summary, off-farm employment and involvement in off-farm business activities have become increasingly important to the nation's farm households. Now more than ever, rural areas need a comprehensive rural development policy, not just a farm policy, in order to ensure the continued viability of both our farms and our rural communities.

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IDENTIFYING FARM ECONOMIC CONDITIONS: DOES OUR
INFORMATION SYSTEM MEASURE UP?

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The USDA farm economic information system is the most comprehensive, conceptually accurate and technically sophisticated, farm information system in existence at this time. The foremost measures of its contribution to agriculture are the thousands of media articles that are written and disseminated each year, based solely on the USDA statistics and their interpretation, and the paucity of dissent with the USDA "numbers." The agencies primarily involved with its development and maintenance, the Economic Research Service and the National Agricultural Statistics Service, can be justifiably proud of its eminent and continuing success. These agencies can be justifiably proud of the progress made, in terms of the clarity, breadth, and effectiveness of how the statistics are presented, with publications that disseminate farm economic information to the public. The dedication of the public servants that have undertaken to provide the U.S. farm sector with the finest set of economic indicators ever made available to agriculturalists, can be heartily commended.

Having recognized the above contributions, I will also briefly highlight a perspective on progress that remains to be made. In so doing, I remind the audience that an academic vice is to seldom be satisfied with the notable accomplishments of colleagues. Given the setting and time constraints, my focus will be on USDA economic information.

The Keystone: The Economic Indicators of the Farm Sector.
The Economic Indicators is the corner stone of USDA farm economic information. The indicators series, published at both the state and national level, is the most widely used and authoritative economic reference in agriculture. Its importance can be glimpsed by simply trying to imagine agriculture without the indicators series. We would not have any idea of the size or health of farm income, whether it is up or down, whether interest expense is still declining or has in fact turned up once more (which it has). Let me list several key categories of information in the National Financial Summary of the Economic Indicators: net farm income, net cash income, livestock cash receipts, crop cash receipts, government payments, capital expenditures, real estate debt, non real estate debt, net worth and capital gains in agriculture.

The National Financial Summary also provides in-depth analysis of economic conditions by sales class and region. Farm and household income is broken out by size of farm sales and region. Gross income and the balance sheet are listed by 7 sales categories of farms, from less than \$20,000 to \$1,000,000 or more annual sales. Net value-added statistics were recently added to the

Indicators publication. Many of the statistical series go back 3 to more than 40 years, to provide historical context. For example, financial ratios are provided for the period 1950 to date. I can also compare receipts, expenses and income by type of farm, whether dairy or cash grains. Finally, recent issues have included a concise narrative summary of definitions and concepts relating to the accounts, and issues that have been raised by, e.g., the General Accounting Office (GAO). The 230 pages in the State Financial Summary of the Economic Indicators of the Farm Sector allow us to compare the receipts, expenses, debt and assets from state to state, in an altogether clear and efficient style of presentation.

The one disappointment that I and many others share regarding the Economic Indicators series is that agriculturalists seldom invest adequate time to "tell a story" with the numbers. The Indicators series is an unparalleled resource that assuredly merits more a more prominent feature in extension and research oriented articles and publications.

The Farm Costs and Returns Survey (FCRS) constitutes a second major resource that is both a separate entity, and is a vital input into the Economic Indicator series. USDA has expended millions of dollars since about 1984 in the development and conduct of the FCRS. Including the overhead cost of staff time involved, in all capacities, the cost has likely averaged from \$2 to \$4 million annually. The results are a statistical treasure that now provides farm financial information by commodity, size of farm, state and/or region.

Without the FCRS input, the quality of the Economic Indicator series would not be satisfactory or acceptable from a statistical perspective. It is imperative that the FCRS continue to be maintained as the pre-eminent annual farm level economic data source in USDA. The cooperation between the National Agricultural Statistics Service (NASS) and ERS in the development of the FCRS can serve as a model for all USDA agencies. This singular cooperation has resulted in the FCRS evolving into an integrated, representative survey with samples of farmers that are consistently drawn with, e.g., NASS's hall mark June Enumerative Survey. NASS also collects monthly receipts by commodity data from its state and/or regional offices which are the principal input into the revenue side of the Economic Indicator series.

A last major feature of the USDA's farm economic conditions statistical framework that merits citation is the bench marking of the ERS statistical accounts with the quinquennial Census of Agriculture. USDA numbers and accounts are adjusted to the Census once every five years. This process is cumbersome, causing readjustments of previously published USDA economic statistics as well as changing the bench marks that are used as "movers" to adjust between USDA partial survey coverage and the global coverage of the Census, until the next Census is published. But, the Census is the Holy Grail. Thus, the USDA bench mark and mover process is a near religious necessity.

What emerges from Census bench marks and movers, the FCRS, and NASS's other statistical accounts, primarily of state receipts by commodity, is a comprehensive set of USDA statistics that can be called "The Majors." I have outlined four independent components that can be referred to as the legs of the economic statistics chair that supports the weight of so many observers of agricultural business during the course of the year. No independent surveys

provide statistically representative coverage that is in the same ball park, or setting room, with the USDA farm economic information.

Measurement and Interpretation Issues.

The remainder of these remarks address two issues, measurement and interpretation, that in my mind can be more fruitfully accomplished by USDA staff with some shifting of resources to statistical work. Bear in mind that the background context explicitly recognizes the impact of both declining budgets and increasing costs of staff benefits, cost of living adjustments that are the bete noire of government administrators at this time.

USDA budgets have never adequately funded the FCRS so that it provides reliable and representative state-level data. Budgets are likely to continue to tighten, and this may mean that the FCRS foot of the economic statistics chair is cracking. The other three legs of the chair are no doubt being stressed by budgetary factors as well.

Given the fact that the theory and practice of organizing and compiling the Economic Indicator accounts is logical and solid, the question that comes to mind is how can the integrity of the accounts be protected and the reliability of the information be, if anything, enhanced. My one suggestion is that ERS and NASS attempt to provide validation data for the expenditure side of the farm income equation, the expenses farmers incur for purchases of manufactured inputs such as chemicals and fertilizer, as well as expenditures for fuel, seed and other accounts that are both large in size and tractable in terms of ancillary data collection. For example, a survey of the receipts received by Pioneer Hybrids and three or four other seed companies could provide valuable information to ensure that the expansion factors used by NASS to make one observation represent, e.g., 100 farmers of like size in the same area, are as precise as possible.

The same type of validation information could be obtained from a handful of fertilizer manufacturers, machinery manufacturers, and suppliers of fuel to farmers. The collection of data from major input suppliers and its use in a judicious manner would greatly enhance my comfort factor with the economic information provided by USDA. The inclusion of more independent data would not supplant the signal efforts of government economists and statisticians, but would introduce the qualities that we attempt so dearly to instill in graduate course work, the qualities of art, creativity and judgment.

Interpretation of the Economic Information.

The second major issue has to do with how effectively the economic based data are interpreted for the public. My experience as an economist suggests that the public is interested a little in methods, and interested a lot in expertise. As a rule the decision-makers in business and government want to be told facts, and to worry as little as possible whether the facts are truly factual or alternatively, fictional. They pay us for facts so they should not have to worry about how we came upon the numbers and ratios that inspire us.

My view is that USDA at times devotes too much energy and bureaucratic propulsion to an elementary recitation of numbers presented for too many sub-categories of regions, types of farms, sales class and categories of income, finance, etc. I recognize that progress has been made in recent years with the publication of short information fact sheets and bulletins, particularly

by ERS. However, more creative efforts can produce even greater dividends than are being reaped today.

Let me provide one example. During the Farm Financial Crisis of the 1980's, the ERS staff analyzing income decided to develop a simple spread-sheet model to determine if land values, which had rapidly spiralled toward the basement, had become affordable from a cash flow standpoint. The exercise involved projecting forward the USDA price and quantity forecasts for corn, wheat and soybeans. It was shown that land had become substantially over-priced during the early 1980's, but that by 1986 land had once again become affordable given the planning prices used by farmers. The publication of this information was received like a birthday present by the financially stressed farmers and lenders in the Midwest and Plains states. This information also provided the metal of conviction that led ERS forecasters to be ahead of the curve in 1987 in forecasting a stabilization of land prices and for a turn-around in the farm economy.

Creative analysis and presentation of the economic information received by USDA can be accomplished more easily and quickly in 1995 because of the several magnitude increases in micro-computer capacity and speed. The challenge for USDA is to bring more analysis of information to the fore through development of human capital within the civil service.

Another avenue for increasing productivity of the economic statistics would be for Land Grant universities and USDA to develop a cost-sharing agreement that would provide ready access to USDA data for more researchers around the country. I recognize the sensitivity of USDA concerning the potential that an observation could be identified, which would seriously damage the credibility of NASS to conduct surveys of farmers. However, the risk that confidentiality would be breached must be weighed against the risk that innovative and costly data collection efforts such as encompassed by the FCRS, may be mortally damaged by future budget constraints at USDA. The essential ingredient is a spirit of cooperation among agricultural observers that all have the same goal of providing quality information to the participants in the farm sector.

Such cooperative efforts provide the best option for resolving the impasses that occasionally develop regarding farm income estimates. The huge discrepancy between Internal Revenue Service (IRS) and USDA estimates of farm income continues to inspire debate in magazines such as Choices. ERS economists have analyzed the IRS accounts and are able to explain much of the discrepancy. However, involvement of the nay-sayers in the analysis of taxable income versus farm income would provide an arms-length resolution to the quagmire of this un-ending debate. Another example is the relative importance of non-farm versus farm income among farm families. The reported proportion of farm income is so small that it has led to a questioning of the USDA income statistics methodologies.

In summary my conclusion are several regarding the ability of the USDA system to measure up to the demands placed upon it. First and foremost, the conceptual and data collection/statistical methodologies are simply world-class. ERS and NASS economists are to be commended for the advances made in the last 10 years, and in the last 2-3 years as well. What we know about the economic efficiency of the U.S. farm sector is anchored in the Economic

Indicator Series and its FCRS and NASS data sources. Second, industry sources of information would provide a useful validation for the economic accounts that would enhance the reliability of the USDA statistical series. Thirdly, there are still gains to be made in the effective interpretation of the economic information that USDA publishes in several formats. Creativity and judgment are needed to give the public more useful information, more meat to go with the potatoes of the raw statistical series. The development of the expertise of the USDA staff is paramount for the generation of new ways to view the data so that the issues can be cristalized. Finally, the sharing of data series with bona fide researchers outside the USDA gates, along with cost-sharing as well, would provide a more efficient way to reap benefits from the millions of dollars invested in the collection of economic information from agriculture.

There are no alternatives to USDA leadership and resources in the quest to improve the economic information that defines the agriculture of America. Billions of dollars of farm program payments and rural initiatives can flow more efficiently the more reliable and accurate information is published describing the competitive conditions of agriculture. I commend the dedicated ERS and NASS civil servants in the impressive gains made since the early 1980's, and my conviction is that even more advances in the telling of the story of agriculture, will be made in the near future.

Remarks by Grant Buntrock, Administrator
Consolidated Farm Service Agency
U.S. Department of Agriculture
to the Grain and Oilseeds Forum
Agricultural Outlook Forum
Arlington, Virginia
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PROSPECTS FOR THE 1995 FARM BILL

It was Charles Dickens who wrote, in a somewhat different context, "It was the best of times; it was the worst of times." These are certainly momentous, even historic times for farm policy.

This year a new Congress with a new majority -- and many new faces in place of some seasoned farm bill veterans -- will decide on the legislation that frames our policies and programs for the rest of this century.

There are a number of factors at play this year that indicate the 1995 farm bill debate will be anything but business as usual. It could become the most significant legislative focus of 1995.

The budget, of course, will be a driving factor in enacting a new farm program. That's not new -- budget support for agriculture has been declining. And today, budget considerations play a major role in everything we do and in how we do it. Those considerations will only intensify in a move toward a balanced budget.

But all the talk of budget cuts and fiscal mandates shouldn't mask the fact that there are other issues at work here -- philosophical or ideological concerns -- that strike at the core of the federal government's role in agriculture.

A Philosophical Debate

The 1995 farm bill debate may be as much a debate of differing philosophies of government as any we've experienced in recent memory ... perhaps since our current system of federal support for agriculture began in the 1930s.

Over the past 60 years, farm programs have changed to meet different needs, but certain broad policy goals have been constants. Farm legislation generally has sought to provide price and income protection for farmers, to assure consumers an abundance of food and fiber, and to promote sound resource conservation.

In short, to bring a measure of stability to the production and marketing of food and fiber that would benefit producers and all those who depend on them.

There have always been important differences over how extensive government's involvement should be, and just how these goals should be achieved. But for the most part, the idea that government should have a role was not questioned. Prior legislation was forged with a consensus that public involvement in the inherently uncertain business of agriculture was a matter of national interest.

This year a number of tough, provocative questions have been raised, most notably by Senator Luger, chairman of the Senate Agriculture Committee, that challenge us to address the underlying assumptions of our farm policy.

The questions hinge on whether the government is too big and involved in too many things. Senator Luger has said he wants to begin the process with a blank page, to look at the justification of every program and keep those that make sense. His questions focus on the current structure of the farm sector, and ask what the impacts would be -- on farmers, on consumers, on agribusinesses, on land values, and on farm credit -- if farm programs did not exist.

He's asked whether our current policies are in the best interests of our nation, or would alternative approaches make more sense. And he's promised to lead off the farm bill discussion with an overview of what the public actually gets from farm programs.

These are important questions, and we welcome the opportunity to answer them. This is a pivotal period for agriculture, domestically and globally. The time is right for those of us in agriculture to examine our objectives, to rethink our programs, and to ask our own questions about what will work best for farmers in the years ahead.

It also gives us the opportunity, in a national debate, to demonstrate that agriculture is a significant force in our nation's economy ... and that American farmers are at the heart of a food and fiber system that generates 16 percent of our gross domestic product and provides jobs for 1 in every 6 of our citizens.

An Educational Process

As we approach the debate, we need to keep something else in mind. This new Congress is more urban and suburban than ever. Particularly in the House, it is made up of men and women who generally don't have a rural or farm orientation. Since 1992, 204 new representatives have come to Capitol Hill, and more than three-quarters of the members of the House Agriculture Committee have never been through a farm bill debate.

This farm bill debate must be an educational, as well as a legislative process. We need to emphasize, to Congress and to the public, that there's a connection between a stable, productive and profitable farm sector and the well-being of consumers, agribusinesses, and our national economy.

At USDA, we've spent months working with farmers and other agricultural constituencies preparing recommendations for the 1995 farm bill. The process is ongoing -- we're continuing to examine all of our programs and proposals, justifying what we believe is needed, and addressing potential distortions in existing approaches. The White House has established task forces on farm bill sections, and USDA has chaired those task forces.

Secretary-designate Dan Glickman fully appreciates the challenges ahead, and he has reaffirmed this Administration's commitment to farmers and ranchers -- the commitment to sustain a solid agricultural economy that provides opportunity for growth and prosperity.

That same commitment will ensure that consumers continue to enjoy a stable, abundant, and affordable food supply that is unequalled anywhere in the world.

As an experienced farm policymaker, Mr. Glickman knows that farm programs have helped create these opportunities, for farmers and for the American people. He believes we should not forget that lesson in this next farm bill debate.

But he also knows, as we all do, that agriculture is not and should not be immune to change. Budget concerns and other forces are bringing change, and we are at a critical juncture for farm policy.

Technology is changing the way we do business. New trade opportunities -- and new trade agreements -- have great potential for expanding our markets. Environmental, food safety, and nutritional concerns are affecting what foods are produced, how they are produced, and how they are handled from farm to table.

In the USDA, in the way we deliver our programs, and in the new farm bill, it is our job to provide the best possible service to producers. We must provide policies and programs that are geared to today's needs.

And that points to one objective: Higher farm income is going to have to come from the marketplace, not from government.

Farm Program Objectives: Flexibility

For the next farm bill, we believe that an aggressive, market-based program is the best way to improve farm income. That goes hand in hand with more flexible, responsive farm programs that enable farmers to make the most of market opportunities.

This next farm bill, more than any in the past, will be drafted in a world of expanding and freer trade. USDA is very optimistic about the growing demand for food and fiber, domestically and globally, and the opportunities available to U.S. producers in the world arena.

In the President's 1996 budget, for example, estimates of program spending for the rest of the decade reflect significant growth in demand for farm products. Implementation of regulations expanding the use of ethanol in reformulated gasoline and other domestic uses will increase demand, as well as our two new trade agreements, GATT and NAFTA.

To foster market momentum, we believe farm programs should be simpler and more flexible. Less restrictive and complex programs will encourage more diversity in production in many areas, raise farm income, and also enable producers to use more environmentally-friendly crop rotations and production practices.

Expanding planting flexibility will be one of our major objectives in the 1995 farm bill. One way to do this is through a combined or total acreage base concept, which could have several benefits. It would reduce the need to plant specific crops to maintain program base and benefit eligibility, and it would enable producers to adjust their farming practices to respond to new market opportunities.

Greater flexibility also enables farmers to use acres more effectively for crop rotations and other conservation practices. Along these lines, some notion of optional environmental flex acreage is also worthy of consideration. This idea would permit producers to designate filter strips, shelter belts, grass waterways or other environmental practices as acres considered planted to a program crop.

A Coordinated Approach

We're aiming to make farm programs and conservation objectives even more compatible than they are today. We can do that through a continuation of programs like the Conservation Reserve, with the modifications that were announced for this year to allow "early outs" and new enrollments to better target environmental benefits and make the program more cost-effective.

The CRP has been proven to save soil, improve water, and protect wildlife, and it has strong support in both the farm and environmental communities. Besides its beneficial environmental impacts, CRP will contribute to stronger crop prices and reduced spending for price and income support.

We're also looking at ways to expand options like the Integrated Farm Management Program and make them easier for producers to incorporate into their production plans. For example, by permitting non-legume crops, such as grasses, trees, or minor oilseeds, in resource-conserving rotations. And by permitting farmers to adjust rotations as necessary to account for prevented planting or failed acres.

In another area, we're reviewing the operation of our Options Pilot Program and various issues we need to address for the future. The results of surveys, focus groups of OPP participants, and other research will be incorporated into a report to Congress on the program's operation this spring.

In terms of future policies, there's been considerable speculation about greater use of futures and options as a form of price protection -- and perhaps merging commercial futures or options instruments with federal crop insurance to form more complete revenue protection. Proponents assert that the growth of futures and options markets now enables farmers to protect themselves against short-term price declines without the need for a government program.

However, direct use of futures and options by farmers is not large, even though a high percentage of producers use these tools indirectly through cash forward contracts and other pricing mechanisms.

Those who do directly use futures and options may be able to enhance their incomes relative to those who do not. But such gains do not replace the deficiency payments of current programs. At this point, futures and options are not a substitute for income support.

Reorganization/Regulatory Reform

Given the budgetary pressures we face, we know that we must do a better job of allocating resources and providing program services. It is important that we rethink the ways we've always done things, so that we can do more with less.

That's not an altogether bad thing. It motivated USDA's reorganization and restructuring of our field operations. Our streamlining will save \$4 billion over five years - money that will come from administrative, not program budgets.

We initiated a comprehensive reform of federal crop insurance so that it can do what it is supposed to do -- provide farmers and ranchers with reliable, convenient disaster protection at a price they, and the taxpayers, can afford. The uncertainty of ad hoc aid has been replaced by the predictability of risk management.

We're also making it easier for farmers to participate in farm programs. My agency began its regulatory reform initiative nearly two years ago, and it is a comprehensive, ongoing effort to simplify farm program regulations and reduce red tape for program participants.

We're cutting paperwork requirements and delegating increased decision-making authority to local CFSA committees. We've made over 45 changes in our procedures so far, and more are on the way. Producers are going to spend less time filling out forms and less time in their county offices.

Taken as a whole, these reforms represent a fundamental shift in the way we administer farm programs. And by reducing administrative burdens on farmers and on our field employees, we're also saving money -- some \$90 million by the time we're through.

Not only will these reforms help farmers now, they also will provide a solid basis for the programs and policies of the future.

Conclusion

Getting new programs enacted in the 1995 farm bill will be a challenge. There are sharp divisions of opinion in the Congress, and within agriculture itself, over what our future policies and programs should be. The debate will provide a forum for these viewpoints. However, I believe that a unified front on basic principles will be all important if farmers are to achieve their objectives in the next farm bill.

It promises to be a lively and momentous debate -- with the outcome far from clear. But we do have a chance this year to promote a program that will sustain a strong farm and rural economy, and that will propel our industry into a prosperous new century.

THE FUTURE OF EXPORT ASSISTANCE PROGRAMS

Christopher E. Goldthwait
General Sales Manager, Foreign Agricultural Service
U.S. Department of Agriculture

If this session of the Agricultural Outlook Forum were being held *after*, rather than *before*, the presentation of the 1995 Farm Bill, I would be able to give you a definite picture of the future of export assistance programs. But the Department is still working with OMB and the White House to develop our Farm Bill proposals. As it now stands, however, what I can share with you are some thoughts and ideas that we in the Department have looked at and believe merit scrutiny. And I can give you my personal views on the general direction in which I see our export assistance programs moving. Let me offer a few ideas.

Of one thing I am certain -- there will continue to be a need for export assistance programs. In a post-Uruguay Round environment, with better trade access and fewer restrictions, the competition for markets is expected to heat up. We have to be ready to face that competition. Call me a pessimist, but our competitors will surely not relax their marketing efforts. In fact, they will likely increase "green box" activities as they scale back export subsidies. There is no question about the potential demand to grow U.S. agricultural exports by 50 percent, which is the goal enunciated for the Department by Under Secretary Moos. The question is whether we or our competitors will benefit from the world's demand growth.

I would like to offer some thoughts on the principles that will guide our recommendations to reform export assistance programs.

--Some programs will be scaled back. The need to scale back will be driven both by budget and by other commitments. For example, funding for Public Law 480 foreign food assistance will be reduced as a result of constrained spending targets for U.S. international commitments and the need to accommodate increased spending for other priority activities. Program levels for the Department's export subsidy programs will be made in keeping with the annual quantity and expenditure ceilings for agricultural subsidies required by the Uruguay Round Agreement on Agriculture.

--Focus on private sector opportunities. Export assistance should be focused on opportunities where eventually the private sector can go it alone without government help. We in government believe that a strong private/public sector partnership is necessary to facilitate international business development and linkages. Our role and responsibility is to

assure a favorable trading and business climate and to create a level playing field for our firms. Credit guarantees and long-term market servicing are types of GATT-permitted activities that we can use to help our private sector on a more permanent basis.

--**A wider range of tools.** We need to offer exporters a wider range of export tools. For example, with respect to credit, we are developing two new programs -- supplier credit guarantees and credit guarantees for facilities.

Under supplier credit guarantees, the Commodity Credit Corporation (CCC) will guarantee payment by foreign buyers of U.S. agricultural commodities and products that are sold by U.S. suppliers on a deferred payment basis. This differs from our GSM-102 guarantees in that foreign banks and foreign bank letters of credit will not be involved in the transaction. Instead, the foreign buyer alone will bear ultimate responsibility for repayment of the credit. The duration of the credit is expected to be relatively short, generally up to 180 days. Supplier credit guarantees are expected to be particularly useful in facilitating sales of high-value products, which are the fastest growing component of U.S. agricultural exports.

With credit guarantees for facilities, the CCC will provide guarantees to improve commodity handling facilities and/or goods and services to address infrastructural barriers to increasing sales of U.S. agricultural products. To be eligible for guarantee coverage, projects must improve the handling, marketing, storage, or distribution of imported -- i.e., U.S. -- agricultural commodities and products.

--**Focus on private sector buyers and their needs.** In addition to our emphasis on bulk commodities, we need to tailor some of our programs to meet the needs of exporters of value-added products. These exporters often have different needs than those of bulk commodities. We should be focusing on those needs, too. For example, should we allow some modest level of foreign content in exports guaranteed under GSM-102 and GSM-103? Our ultimate goal should be able to support all categories of exports -- bulk, intermediate, and high-value.

--**Working smarter.** Lastly, but very importantly, we need to do a better job using our programs in better concert with each other. We'll be working with our cooperators and trade groups to use our various tools in a concerted way to tackle specific export objectives and obstacles. The enhanced FAS strategic planning process will be critical to this effort. Greater program scrutiny, constrained budgets, and a wider scope of activities mean we have to work smarter. There is a greater need to develop an ongoing, long-term market training program that focuses on all phases of long-term strategic market planning.

Let me now mention some options for improving the programs. These are not Administration Farm Bill positions, but only ideas that have come out of the hundreds of conversations within the Department, with program users, farmers, and trade groups. Let's call them interesting ideas for discussion and debate.

--**Food Aid:** After 40 years of serving as the cornerstone of our food aid efforts, Public Law 480 will not be immune from our reinvention efforts. This program is a prime example of where we will have to do more with less. Perhaps smaller programs will be targeted toward *sectors* of the recipient country's economy, not *entire* countries. Should we therefore have authority to enter into Title I agreements with private entities as well as governments? One thing that is clear is that P.L. 480 needs to be more flexible and responsive to the world we live in. We are examining ways to be more responsive to a country's particular circumstances. Countries are not static. Is there a way to make this program more customer-oriented and a better market development tool?

--**GSM-102/103:** The GSM-102 and GSM-103 export credit guarantee programs help assure the availability of credit to finance commercial agricultural exports. These programs operate within a relatively narrow range of credit risk. The purpose is to underwrite export credit that would not otherwise be made by the commercial sector. But we want to avoid assuming so much risk as to compromise our reasonable expectation of repayment. Should we have distinctly different creditworthiness requirements for short-term and longer term programs? Are there other, more "creative" ways to use the program? Increasingly, the export credit guarantee program is making use of private sector banks to facilitate loans. One of the most exciting trends throughout Eastern and Central Europe, for example, is the tremendous growth in the emerging private sector. Since USDA initiated its private sector programs in this region, more and more banks have expressed interest in participating in the program. Also noteworthy are initiatives such as the one used in January under which USDA authorized \$10 million in credit guarantees in connection with sales to Bosnia and Herzegovina. What was noteworthy about that initiative was that *Slovenian* banks will be facilitating the sales.

--**EPP:** The major change to broaden the focus of the Export Enhancement Program took place in the GATT implementing legislation. We are working with the agencies that are part of the Trade Policy Review Group (TPRG) to implement this. But let me just say that under the Uruguay Round Agreement, the United States is committed to reduce agricultural export subsidies over a six-year period. For us, reductions in the quantities of products exported under our subsidy programs will be carried out on a July-June basis, beginning in July, while the reductions in expenditures for export subsidies will be carried out on an October-September basis, beginning in October. As a result, the 1996 program levels will reflect the first phase of these reductions. However, funding for these programs has been provided at the maximum levels that are consistent with the quantity and expenditure reduction commitments required by the Uruguay Round Agreement.

--**MPP/FMD:** Significant changes have been made in the final rule that FAS published earlier this month for the Market Promotion Program (MPP). Administratively, we want to make the program more user-friendly. Working with program participants, we may need to focus more on how to serve private buyers overseas, and how to draw new and small U.S. companies into exporting. Small businesses employ over half of the private work force in

the United States. They contribute over half of all sales in the country, and they are responsible for half of the private gross domestic product. They deserve a chance and have great potential to make an expanded contribution to our export efforts. FAS is working diligently to help small-scale U.S. producers, processors, and exporters compete for a share of world trade. We have boosted our outreach efforts and improved our MPP program.

The changes that we have proposed in the MPP program will broaden it and make it easier for participants to use. Under the new regulations, U.S. exporters no longer need to show that their products face unfair trade competition. There will be more emphasis on assisting small businesses, paperwork requirements will be reduced, and the application approval process has been clarified.

The Foreign Market Development Program (FMD), or our cooperator program, is a partnership between U.S. farmer organizations and USDA that has allowed us to combine forces and pool our technical and financial resources to initiate and carry out a wide variety of foreign market development projects. Our support, which is operated on a cost share basis with the U.S. export community, focuses on expansion into areas of the world where the greatest market development potential exists. To the extent feasible, we will reduce support for activities and administration in established markets, but remain committed to expanding some of our most successful trade servicing efforts and enhance foreign marketing expertise.

--**Emerging Democracies:** Some have suggested that an "emerging markets" rather than an "emerging democracies" focus would provide a tool flexible enough to be used in all of the best growth prospects for agricultural exports. For example, terming Mexico an "emerging democracy" is condescending; Mexico has been democratic for generations. Yet it remains one of our best long-term *emerging markets*, and this program could be invaluable in exploring new market segments.

In conclusion, while I may not have answered all your questions on specifics, I hope I have stimulated a dialogue. I have tried to advance a few of the principles that are guiding our review of export assistance programs as the Farm Bill approaches. But clearly as we finalize our Farm Bill proposals, we will need everyone's thinking skills. I have tried to provoke your thinking by offering some of the more imaginative suggestions that have emerged so far.

The 1995 Farm Bill-Some Impending Issues

Abner W. Womack

The current farm program is delicately balanced around a set of interlinked objectives. These include adequate income for crop and livestock producers, adequate food supplies at reasonable prices, maintaining a viable export market, maintaining adequate stocks in the event of short crops, protecting the input industry, encouraging conservation and environmentally sound practices and the economic enhancement of rural areas. All of this is to be achieved at the least cost to the government. Traditionally meeting these objectives required CCC outlays of around \$10 to \$14 billion per year. Budget pressures makes it extremely unlikely that this level of support can be maintained. Obviously some point is reached where this program unravels and is no longer manageable. Incentives for remaining in farm programs will be extremely low essentially unraveling the voluntary structure of this current farm program. These risks, and their implications, represent tough questions to be dealt with during the 1995 farm bill debate.

Several options are already on the drawing board that attempt to circumvent these anticipated problems. Among the leading contender are:

- Staying the course and attempting to stop the slide in government support with modifications that involve greater flexibility
- Green farm programs that provide incentives for conservation and environmental objectives
- Revenue Assurance Program-a decoupled strategy that basically guarantees a minimum income support. The program is primarily government supported, but allows complete flexibility in producer production decision.
- Revenue Insurance Program-also a decoupled option that relies heavily on an insurance program as the primary vehicle for minimum income protection. This program also provides producer flexibility in planting decisions
- Modification of current farm program that eliminate target prices and raises loan rates at or near longer run market equilibriums.

Has the time really come to consider the abandonment of the current farm programs? One axiom comes to mind, farm programs generally follow the path of evolution, not necessarily revolution. If so patching up the current farm program becomes a prime contender. It is currently very favorably regarded by both the crops and livestock sectors. Why? From the crop producer stand point, returns per acres are at or near record levels for program participants, why? Low set-aside requirements. In the 1994/95 crop year all major feed grains, wheat and rice were planted in a tight stock environment with zero set-asides. Seems a contradiction, major cuts in farm support but near record returns for program participants. A major factor is the 36 million acres in the conservation reserve program. More than any other factor this has contributed to the higher returns associated with low set-aside requirements.

Looking ahead, the crop sector is heavily conditioned on what happens to the CRP program. Slight definition changes for extending qualifying land could result in significant shifts away from current regional patterns. Regional issues will certainly receive a good amount of attention. Another factor associated with CRP extension is the possibility of continuing this fairly tight land and stock situation. It calls to attention the issue of buffer stocks and food security. Recent runs by FAPRI suggests that this may indeed be the case. A full extension of CRP may tighten the supply situation to the point that a major drought would be exceeding difficult to overcome. Low stocks as a buffer would result in long term damages to the livestock industry, raise food prices and damage our trade position in world markets. All of this is simply to point out that more care must be taken this time around on the level of lands that can be spared in the CRP program and at the same time ensure food and feed price stability. Least we forget, remember price freezes of the 1970's.

Livestock producers have also fared reasonably well. Lower loan rates and up to this point, adequate supplies has resulted in a fairly complementary program for this industry. In fact since the enactment of the 1985 farm bill, feed grain and high protein prices have been a stimulant for the current strong supplies on the market.

Can this farm program survive in this budget environment? The key to this answer is the level of additional cuts. If in 1995 those are in the \$2 billion range, then expected returns to crop farmers will make this a strong contender. Set-aside levels are likely to be low, helping to cushion these cuts. So it is likely that a variation of the current program will be the outcome. But our analysis suggests that this may be short lived. Additional cuts in the \$2 to \$3 billion range simply pulls the payment levels down to the point that by 1998-99 little difference could be expected from program participation. Finally this voluntary program unravels and not enough monies to hold farmers carries other serious ramifications. In fact it places the farm program on a direct collision course with the environmental and conservation thrust. Conservation compliance for example is a direct requirement for program participation. Little or no participation implies very little leverage for this critical component of farm programs.

The unfortunate characteristics of farm programs - they tend to perpetuate the current situation and hence lag major structural changes. We may in fact do the same in 1995, only to find that the program no longer works by the 1998-99 period.

A midcourse revision is an exercise that has been going on since enactment of the 1981 farm bill. That particular program was put together in an expanding world trade environment with high rates of inflation. Anticipating these trends resulted in target price escalators and relatively high loan rates. By 1983 these factors had reversed and the farm program went through a major downward adjustment, it's actual shelf life was less than two years.

If we stay with this farm program then budget cuts will have to be stopped. If not, we're on a new path and revenue insurance as a decoupling mechanism stands as good a chance as any other option currently on the books. But revenue insurance alone will not balance the books on

all expectations associated with farm program management. Consideration will be necessary for several other components. Debates will be necessary for vital thrusts associated with conservation and environment, rural development, food reserves-adequate stocks, trade buffers in the event of unfair practices, etc. These items cost money also.

So the debate may well be lead by budget cuts. If continued at current rates this current program will finally be dismantled. Putting together other options however may not result in less monies for farm program management and operations.

Several of these program objectives spread far beyond the farm gate and all cost monies to achieve. Targeting these objectives may be more productive, but in final analysis we may be very surprised to find that other decoupled options require very similar costs when all components are considered. We may be near the bottom of the barrel as far as farm program costs are concerned. We may push the budget theme too far only to find that critical issues, not covered, are simply too costly to be left out. Then we have to revisit - implying several rounds of activities before the sun goes down on the 1995 farm bill version.

U.S. AGRICULTURAL EXPORT COMPETITIVENESS:
POLICY CHANGES NEEDED

David C. Lyons
Vice President for Government Relations
Louis Dreyfus Corporation

Agricultural Exports Represent Growth Opportunity

The future looks bright for U.S. agricultural exports. The Uruguay Round Trade Agreement, the North American Free Trade Agreement (NAFTA) and the general trend in the world toward privatizing agricultural production and trade, will mean a more open-competitive trading environment for U.S. agricultural products. A more open competitive world trading environment will mean improved market access for U.S. products, and increased world economic growth. This combined with world population growth, will result in continued steady growth in world consumption and trade in agricultural products.

- Increased world income arising from the Uruguay Round Trade Agreement alone has been estimated to be as much as \$5 trillion over 10 years.
- The Uruguay Round is the beginning of world trade liberalization for agricultural markets. For the first time, agricultural trade liberalization was negotiated as part of a round of multilateral trade negotiations. Future negotiations will surely result in even further agricultural trade liberalization.
- Even with the recent economic problems and peso devaluation in Mexico, NAFTA will, over time, increase exports of grains and oilseeds to Mexico.
- The trend toward privatization of production and trade in agricultural goods is happening in many countries around the world. Russia, China, Mexico, and Egypt, are a few examples. Although it is disappointing to lose the large government purchases from Russia, this trend toward smaller more numerous purchases from "private buyers" in many countries represents new export opportunities for the United States.
- The countries of Asia and the Far East offer tremendous potential for growth. Growing populations and growing incomes in China, Vietnam, Indonesia, Malaysia and even India will result in growing demand for grains, oilseeds, vegetable oil, and protein meals.

Natural Competitiveness of U.S. Grain Industry

Competitiveness will be the key to realizing this growth opportunity for United States Agriculture. Competitiveness means the ability to produce and deliver, in a timely manner, the product, the quality and the quantity demanded by foreign buyers at the world price.

Among grain and oilseed producing and exporting countries, the natural competitive position of the U.S. is unmatched anywhere in the world.

- Skilled, well capitalized growers;
- Large area of good quality land suited to grain and oilseed production;
- Reliable climate;
- High level of technology providing for low cost production.
- Sophisticated agricultural input supply industry, including a sound banking system and low cost futures markets, to facilitate risk management and price discovery.
- Market grading and inspection system that insure the foreign buyer receives the quality and quantity desired; and
- Unrivalled export infrastructure for delivering large quantities of the desired qualities demanded in world markets.

Lost U.S. Bulk Grain Export Competitiveness

U.S. agricultural exports peaked at almost \$44 billion in 1981. Today, fourteen years later, the U.S. is only now regaining the export value levels of the early 1980s. Value added exports have expanded but bulk grain exports and U.S. share of world bulk grain exports have declined, even as world consumption and trade in bulk grains continued to grow.

Several reasons are often cited for lost U.S. competitiveness:

- High U.S. loan rates
- Strong U.S. dollar valuation
- Unfair export subsidy competition
- U.S. supply management programs

In the early 1980's, high loan rates, the strong value of the U.S. dollar, and export subsidy competition contributed to U.S. grains and oilseeds becoming uncompetitively priced in world markets.

The U.S. government was forced to "buy" large stocks of grain through the CCC loan program which resulted in large government costs. By the middle of the 1980's, the value of the dollar had fallen, loan rates had been dramatically reduced and direct export subsidies for wheat and several other commodities were initiated.

In addition, beginning in 1983, in response to large government stocks and large government farm program costs, various government supply management programs were initiated. These programs, which have removed an average of 60 million acres of productive land each year, continue to the present time.

Policy Changes Needed to Regain Competitiveness and Realize Growth Opportunity

Supply Management Programs

Lower loan rates and direct export subsidies could not overcome the "brake" on competitiveness caused by supply management programs. For the period since 1981, world production and consumption of grains and oilseeds continued to grow while U.S. government supply management programs caused U.S. production to remain static.

- Since 1981, world production and consumption of wheat has grown by about 20 percent; coarse grain production and consumption has grown by about 10 percent; and world soybean production and consumption has grown by almost 40 percent.
- At the same time, after adjusting for production variations due to weather extremes like 1993 (small crop) and 1994 (large crop), U.S. production of wheat, coarse grains and soybeans, has remained almost constant.
- U.S. market share of world trade has declined dramatically in recent years:

Wheat - almost 50 percent in 1981-82 to the low 30 percent range in each of the last five years;

Coarse grains - over 65 percent as recently as 1989-90 to the mid 40 percent range in 1993-94; and

Soybeans - over 80 percent in the early 1980's to the mid 50 percent range in recent years.

- In the current marketing year 1994-95, the U.S. market share for coarse grains and soybeans will improve because of improved world demand and the large 1994 crop. Unfortunately, the USDA policy response was to impose a 7.5 percent acreage reduction program (ARP) for the 1995 corn crop.

Export Programs

A stronger world supply demand situation, the limitation on export subsidies imposed under the Uruguay Round Trade Agreement, and U.S. budget pressures make it essential to reconsider the proper role, if any, for U.S. export subsidies. For far too long, the knee jerk reaction has been that if the European Union uses export subsidies, then surely the U.S. must use export subsidies in order to be competitive. Policy makers need to look beyond this simple rhetoric.

If the U.S. follows the proper macroeconomic policies so the dollar is not overvalued and U.S. agricultural policies result in prices which are competitive at world levels, there should be no need for U.S. export subsidies.

GSM Credit Guarantees and PL-480, Title I concessional sales for market development purposes are the export programs most helpful to U.S. export competitiveness.

Export programs alone, even direct export subsidies, can not make U.S. grain and oilseed exports competitive in world markets. For the U.S. to regain competitiveness, it will require a commitment to produce for export markets through elimination or modification of existing supply control programs. Only then will the agricultural export growth opportunity of the coming years be realized.

Will Agricultural Policy Change in 1995?

Federal budget pressures will make it very likely that agriculture policy will change. It is not yet known how large the budget reductions will be for Commodity Credit Corporation programs, but most knowledgeable observers believe the reductions will be 20 to 30 percent. If budget reductions are this large, then one way or another, growers will have to look toward a more market oriented agricultural policy to increase income.

There are a couple of general ways that a change in policy could evolve.

- (1) Grower groups could realize that the necessary budget reductions make the supply control structure of current farm programs unworkable. These groups then could work together to develop an income safety net program without supply control characteristics.
- (2) More likely, there will be no consensus among grower groups on how to restructure farm programs and the Congress simply will

make the reductions against the current programs. This would likely result in target price cuts or a reduction in payment acreage. With this scenario, as producer benefits are reduced, over a period of time, growers would opt to leave the farm programs. Soon a significant portion of U.S. production of grains would take place outside of farm programs.

Either way, U.S. agriculture will become much less government program oriented and more market oriented.

What will the U.S. Grains and Oilseed Industry Look Like in Coming Years?

- Stronger world demand as population and incomes continue to grow.
- Freer, less government distorted trading environment.
- U.S. agricultural policies which will allow U.S. agriculture to take advantage of growth opportunities.
 - (1) Grower flexibility to plant for market demand.
 - (2) U.S. government land retirement for only environmentally fragile land.
 - (3) Very limited, if any use of export subsidies for bulk grains and oilseeds. Export subsidies are more likely to be used on value added products.
- The U.S. will regain its natural export competitiveness for bulk grains and oilseeds.
- The policies necessary for export competitive grains and oilseeds are the same policies necessary to maintain export competitiveness of the value added agricultural exports.
- Bulk grains and oilseed exports will expand in the developing countries of Asia and the Far East.
- Grain and protein meal based value added meat and livestock product exports will expand in the high income countries like Japan and Korea.

Market demand will determine the blend of bulk versus value added exports. The golden age of U.S. agricultural exports was not the export surge of the 1970's, but instead is ahead of us as we look to the next century.

USDA PERSPECTIVE ON THE OUTLOOK FOR COTTON

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The outlook for U.S. cotton continues to be a positive one as the twenty-first century approaches. Although budgetary pressures to reduce farm spending will remain a challenge, the efforts of the cotton industry to furnish new markets with U.S. cotton and cotton products continue to yield beneficial results for the entire industry. And with the new trade agreements in place, U.S. cotton will continue to play a vital role in the international market, as well as in the United States.

1994/95 Situation

U.S. Production and Consumption

U.S. cotton production is estimated at a record 19.7 million bales, well above the 16.1 million produced in 1993. Upland production is estimated at 19.4 million bales and extra-long staple (ELS) is projected at 342,000. Last August, the crop was expected to total 19.2 million, but improved weather conditions, primarily in the Southeastern and Delta States, increased yields and the crop size. The national average yield is forecast at 710 pounds per harvested acre, 4 pounds above the record set in 1987. The 1994 acreage abandonment rate, estimated near 3 percent, is less than half the previous 10-year average.

Production in the Southeast is estimated at 3.7 million bales, up 19 percent from the August estimate, and 89 percent above last year. Yields increased each month during the season, raising output to its largest since 1937. Georgia's production, at 1.6 million bales, is up 19 percent from August and equaling the State's largest crop. Similarly, North Carolina's crop is forecast at 820,000 bales, the largest since 1928.

The Delta States are expected to produce a record 6.9 million bales, 8 percent above the August estimate, and 48 percent above last season's crop. Yields in the Delta improved throughout the season and are estimated at a record 815 pounds per harvested acre. Arkansas is expected to produce 1.8 million bales, 61 percent above the 1993 crop and the largest since 1948. Cotton production in Louisiana is also up significantly at 1.5 million bales, the largest on record.

In contrast, estimates show upland yields and production lower this season in the Southwestern and Western States. For the Southwest, production is estimated at 5.2 million

bales, with yields averaging 458 pounds per harvested acre. In the West, the crop is expected to total 3.6 million bales based on a yield of 1,179 pounds.

Yield and production forecasts were also lowered during the season for ELS cotton. Despite this, yields are expected to average 987 pounds per harvested acre, the second highest on record. However, 1994 ELS production is the smallest since 1988. The final USDA 1994 upland and ELS cotton production estimates will be released May 10.

Domestic mill consumption of cotton is projected to rise for the fourth consecutive season to its highest level since 1942. Mill use is forecast at 11.1 million bales this season, 6.5 percent above 1993/94. Data for the first 5 months of 1994/95 (August-December) indicate U.S. mills have consumed 4.64 million bales, compared with 4.24 million a year ago. On a seasonally adjusted annual rate basis, cotton consumption during August through December averaged 11.1 million bales.

Cotton mill consumption's strength is expected to continue as demand for U.S. cotton textile products remains robust both here and abroad. In support, cotton textile exports have risen for 10 consecutive years. During calendar year 1994, textile exports increased 15 percent above 1993 to surpass the one billion pound level, a new record. However, cotton textile imports have also reached new highs, expanding to nearly 3.8 billion pounds in 1994. Nevertheless, larger cotton textile exports continue to moderate increases in the textile trade deficit.

The solid demand for cotton can also be illustrated by its share of fiber use on the cotton system, which has increased each year since 1983. For the first 5 months of 1994/95, cotton's share has averaged nearly 77 percent, the highest since 1967. More impressive, however, is the fact that cotton's share has risen in an expanding fiber market, the result of the strong demand for denim, as well as for cotton apparel and home furnishings.

Foreign Production and Consumption

Outside the United States, production and consumption have been less robust. As the 1994/95 marketing year began, foreign beginning stocks had fallen 10 million bales in the preceding 2 years. Decreased crops in China accounted for most of this decline. Pakistan's crops fell during the same two years, but had a much smaller impact on stocks. However, a second year of shrinking supplies of Pakistani cotton played an important role in the large price increases that carried over into 1994/95.

With higher prices, foreign area rebounded in 1994/95, climbing 6 percent from its lowest point since the 1950's. China's area rose the most--11 percent or 550,000 hectares--and strong gains were registered in India, Brazil, and Argentina. In Uzbekistan, area fell for the seventh consecutive year despite the availability of higher world prices. And Australia's area fell following 3 years of drought that severely hampered irrigation.

While foreign area was higher in 1994/95, at 26.9 million hectares, it still remained below the levels reached during 1988-92. China's area remained 15-20 percent below the peaks seen during this period. Surging prices for other agricultural commodities and persistent pest

problems decreased the attractiveness of producing cotton in China, as did a legacy of IOU payments to farmers. In the former Soviet Union, area fell 21 percent between 1988 and 1994 as decades of environmental damage took its toll, and changing priorities led Central Asian cotton producers to shift area to food crops.

Foreign production rose an estimated 3.5 million bales in 1994/95, due almost exclusively to area gains. Yields rose slightly as gains in China, Uzbekistan, and Turkey helped offset lower yields in Pakistan. Yields in India were unchanged as a more than adequate monsoon assured sufficient moisture in most areas, but hampered yields in other areas through flooding and pest development. As the season progressed, yield prospects in the Punjab were progressively lowered as a second year of pest damage unfolded in India's north. Similarly, earlier hopes for a rebound in Pakistan from the insect problems of a year earlier were dashed. Persistent September rains hampered spraying in Pakistan's Punjab, and insects and disease cut yields 5 percent.

Foreign consumption is expected to fall about 550,000 bales in 1994/95 to 73.9 million. Two years of falling consumption in China--the world's largest consumer--account for some of the decline. China's cotton consumption is expected to decrease slightly--based on sluggish yarn production early in the year--and with lower use, higher production, and higher imports, China's ending stocks are expected to rise in 1994/95. China is expected to import in the face of high world prices and growing domestic supplies to help fight inflation and meet regional stock-building needs.

Similarly, the fifth consecutive contraction expected in Russia's textile industry is also important. Declining cotton consumption in Russia and elsewhere in the FSU has been the major factor behind the falling and stagnant foreign cotton consumption since 1989/90. In 1994/95, FSU cotton consumption is forecast to have fallen 65 percent since 1989/90, to its lowest in at least 35 years.

World Trade

The failure of foreign production to sufficiently rebound in 1994/95 has had a significant impact on world trade. World cotton trade is projected at 28.6 million bales in 1994/95, up nearly 2 million bales from last season and the largest since 1990/91. In 1993/94, tight supplies had forced India and Pakistan to precipitously curtail exports and seek much larger than usual imports. With production in 1994/95 again below consumption, India and Pakistan are expected to import about 600,000 bales each, and cut their exports for the third consecutive year. With net imports for the two countries exceeding 1 million bales, India and Pakistan are expected to have their worst joint trade performance in cotton in at least 35 years.

China's increased imports have also had a significant impact on world trade in 1994/95. In 1993/94, China began its import purchases late in the season and, despite an expected higher crop in 1994/95, accelerated its buying through the first half of this year. With large imports reported through November, and even larger outstanding purchases, China's imports are expected to reach 3 million bales, below the 4.1 million imported in 1979, but the third highest ever.

Few exporters outside the United States are well positioned to take advantage of this increased demand for cotton. While the African Franc Zone is expected to boost its exports 870,000 bales, Australia's exports are expected to be hampered by a smaller crop, and Uzbekistan's by low stock levels and a smaller crop. The increasingly favorable trade prospects have been reflected in U.S. export sales this season. Export commitments continued rising in early 1995, growing over 500,000 bales and totaled 10.7 million bales by early February. U.S. exports are forecast at 9.6 million bales this season--2.7 million more than a year ago and the highest since 1926. Based on these estimates, the U.S. share of world trade is expected to exceed 33 percent, the highest since 1960.

Ending stocks are expected to rise outside of the United States in 1994/95, largely because of growing stocks in China. Excluding China, stocks are expected to tighten slightly, from 34 percent of consumption to 33 percent. Like China, Pakistan and India are expected to build stocks in part to help bring their domestic prices down.

1995/96 Outlook

U.S. Production, Consumption, and Trade

The U.S. outlook for 1995/96 points to much larger planted acreage as a result of the zero percent upland ARP and current price levels as planting time approaches. Total cotton acreage in 1995 could surpass 16 million acres, with a likely range of 15.7-16.2 million acres. This compares with an early-January survey conducted by the National Cotton Council (NCC) which indicated 1995 intentions of nearly 15.6 million acres. Although below the range mentioned above, the NCC survey provided producers' initial planting intentions but did not include those producers who may be planting their first cotton crop.

Although area could rise more than 2 million acres above this season, a return to more normal abandonment and yields may limit the potential of the 1995 crop. If the abandonment rate is near the 10-year average of about 7.5 percent, harvested area, based on the aforementioned planted acreage, would range between 14.5 and 15 million acres in 1995/96. While abandonment is expected to exceed this season's low 2.9 percent, yields are projected to decline from the record 710 pounds per harvested acre reached in 1994. Preliminary yield projections for 1995/96 range between 650-670 pounds per harvested acre, with the midpoint of this range, 660 pounds, equal to the 1990-94 crop year average.

In 1995, the U.S. cotton industry could witness back-to-back record crops. Based on the acreage and yield assumptions presented here, cotton production would likely range between 19.5 and 21 million bales in 1995/96. Coupled with the current beginning stock estimate of 2.7 million bales, total cotton supplies next season should range in the 22 to 24 million bale area.

Cotton mill consumption in 1995/96 is projected to extend its expansion as natural fiber products continue to dominate consumer purchases. As in 1994, cotton textile exports are also expected to play a vital role in the continued growth of U.S. cotton mill consumption.

Cotton textile exports reached a record in 1994, due in part to the positive effects of the North American Free Trade Agreement (NAFTA) which began in January 1994. Participation in agreements such as NAFTA should bode well for U.S. cotton textile products in the future, although textile imports are also expected to increase. Overall, improved demand for U.S. cotton products here and abroad could push U.S. cotton mill use to a new record. Current projections are for 1995/96 consumption to range between 11.2 and 11.7 million bales.

U.S. cotton exports, on the other hand, are expected to decline from the dramatic gains likely in the current season. Relatively low foreign stocks and the production problems in several of the major producing countries in 1994/95 led to the surge in U.S. cotton export commitments. In 1995/96, however, foreign production is expected to rebound somewhat. This would limit foreign import needs and possibly provide available exportable supplies to compete with U.S. cotton. More foreign competition translates into lower U.S. exports next season, perhaps as much as 2 million bales below the current season. Early projections for U.S. cotton shipments during the 1995/96 season range between 7.5 and 8.5 million bales. Although exports would be below the current season's level, the U.S. share of world trade would remain well above average, ranging between 27 and 31 percent.

Despite the anticipated decline in total demand for U.S. cotton next season, another record cotton crop may only boost stock levels modestly in 1995/96. Based on the scenario presented here, carryover stocks next season could increase to the 3 to 4 million bale level. However, with total use at or near record levels, this gain in carryover is meager at best, implying a stocks-to-use ratio of less than 20 percent and reflecting the need for another large U.S. cotton crop in 1996.

Foreign Production, Consumption, and Trade

In 1995/96, foreign production could total 65-75 million bales as area continues to grow and yields return closer to normal. Another year of rising prices is expected to boost area in most producing regions. China's announced target for cotton area is 6 million hectares, up 8 percent from 1994's planted area. In India and Pakistan, consecutive years of disappointing production and surging prices are expected to encourage additional production.

Foreign area of 28 to 29 million hectares is expected in 1995/96. Note that foreign area has surpassed 29 million hectares only twice before--1984/85 and 1991/92. Each time that occurred, China planted more than 6.5 million hectares and Central Asia exceeded 3 million. Since China and Central Asian producers seem to be setting their targets a total of about 800,000 hectares below these levels, a particularly strong price response elsewhere would be necessary if total foreign area is to exceed 29 million hectares.

Higher foreign yields are also likely in 1995/96, ranging from about unchanged at 520 kg/ha to 550 kg/ha. While it is reasonable to assume that yields outside China and Pakistan rise slightly to return to trend, prospects for China and Pakistan are unclear. China's yields are estimated to have improved in 1994/95, but remain below averages of the recent past. Whether this suggests one can assume a normal, higher yield in 1995/96 remains to be seen. Similarly, Pakistan's failure to deal with successive years of pest problems in one of its most crucial industries either suggests a greater likelihood of redoubled effort and success in

1995/96, or that Pakistan will be forced to endure such problems for years to come.

Foreign consumption in 1995/96 could range somewhere between 72 and 78 million bales. A continued improvement in the economic outlook in the foreign industrialized countries--particularly with respect to consumer spending--and a rebound in China's consumption provide much of the basis for anticipating an increase. In addition, real incomes in Russia are expected to rise in 1995, the first time since 1989. If the prolonged decline in Russian textile production ends in 1995/96, a significant drag on world consumption will be removed.

Prospects for imports are weaker in 1995/96, despite the improved consumption outlook in several importing countries. China's imports are likely to fall following 1994/95's stock build-up, and improved production would very likely cut imports by India and Pakistan.

Outlook to 2000

Farm Bill Issues

Policy discussions over the next several months will focus on enactment of the 1995 Farm Bill. Although several ideas concerning the new legislation, ranging from a continuation of the 1990 Act to its elimination, have been discussed, little in the way of specifics has been forthcoming. The Administration has yet to make a recommendation. However, on February 6, the President released his Budget proposal for FY 1996, which would be the first year of the new Farm Bill. A single paragraph in the USDA summary of that budget was the only hint of the Administration's thoughts on the Farm Bill.

"The Budget does not include farm bill proposals for the commodity price and income support programs. However, reductions estimated at \$1.5 billion in total over the 1998-2000 period are planned...Specific measures to achieve the targeted savings will be proposed at a later date."

In a press briefing, a USDA budget official reiterated that the specific means of cutting the farm support budget by \$1.5 billion had not been worked out.

Meanwhile, on Capitol Hill, the chairman of the Senate Agriculture Committee has developed a list of questions on farm policy which imply that the very continuation of farm programs is at least open for debate. The chairman of the House Agriculture Committee appears to support the continuation of the programs, but will have to scale them back to meet budgetary requirements.

Although there is nothing definite yet as to specific policies that might be changed in the new Farm Bill, a case can be made that the cotton program should not be greatly altered. The program has worked, although the cost was high for a couple of years after the breakup of the Soviet Union. Central Asian cotton was placed on the world market at very low prices and program costs averaged over \$1.8 billion per year in FY 1992 and FY 1993. Last year, program costs began to come down as U.S. mill use and exports rose. Mill use has risen 2.5

million bales since enactment of the 1990 Act, and the U.S. share of world cotton trade has climbed to well over 30 percent this year, averaging nearly 26 percent since 1991. The FY 1995 crop is projected to cost only about \$350 million.

With cotton program costs declining and use of cotton increasing, some argue that things are headed in the right direction. However, if program cuts are needed to meet budget targets, there are certain program provisions that are likely candidates for change, either because budget reductions based on them would be easy to write and administer, or because they have been discussed at great length.

For example, many believe that an increase in the non-paid acres--the triple base acres--will be enacted as a budget saver. This would be easy to write, very understandable to observers and to farmers, and could be done either in the Farm Bill itself or the budget reconciliation process that will also have to occur during this session of Congress. The money to be saved from increasing the triple base is fairly easy to estimate, and the savings would be "real" savings. All of the money would come out of the farmers' pockets, however, because acreage on which deficiency payments could apply would be lower.

In addition, the Office of Management and Budget (OMB) has proposed for some time that anyone with off-farm income of over \$100,000 should not be allowed to receive farm program benefits. OMB wants to "target" program benefits to producers who truly "need" them and who are primarily farming for a living. They believe this proposal will save money by keeping larger farmers out of the program, but there is not a good, defensible estimate as to how much might be saved. This idea would have a lot of public appeal, especially in a year when there is much debate in general about government benefits and who does or does not "deserve" them.

There has also been some discussion about the "Step 2 program" which makes competitiveness payments to domestic mills and to cotton exporters. Many suspect it will be eliminated in the 1995 Farm Bill. The savings from doing so are not readily estimated, however, since the provision contributes to the competitiveness of U.S. cotton. Without the provision, U.S. cotton would presumably be less competitive overseas and offtake may suffer. That decline would be made up by higher ARPs which could possibly lead to higher government costs in other areas such as deficiency payments.

Another item suggested for elimination is the 0/85 and 50/85 provisions for payment on under-planted acreage. This provision is little used by cotton farmers, who enroll only 200,000 to 300,000 acres in a given year. It has served as a stand-by disaster payment program, but the Crop Insurance Reform has reduced its attractiveness for that purpose since insurance indemnity payments must be foregone if payments are claimed for prevented planted acres. The Integrated Farm Management (IFM) provision of the 1990 Act employs 0/92-type payments as incentives for participation, and its environmental benefit might be lost if such payments were no longer available.

Much interest has also been expressed in providing farmers more planting flexibility than has been afforded them under current law. An expanded triple base would do that, but at some cost to producers. An alternative being discussed is the "Total Acre Base" (TAB) concept in

which the farm's acreage base for program purposes would be the sum of all base acreage for the individual program crops now recorded on the farm under current law. Under the TAB approach, producers could plant any program crop or approved nonprogram crop on any or all acreage in the TAB. There would be no planting limitation except for the size of the TAB. Deficiency payments would "belong" to the original base acreage, however, loan benefits would continue to apply to the crop actually produced, not to the base acreage. The potential impact of this proposal on program costs may limit its appeal.

U.S. Outlook

The outlook for the U.S. cotton industry continues to look very positive over the next several years. The cotton sector, as a whole, is expected to gain partly as a result of the GATT agreement. While growth in domestic mill use and exports will be affected by the agreement, lower trade barriers are required with increased world trade anticipated over the next decade.

Growth in domestic mill use may slow as import quota restrictions are eased during the phase in period. Despite the potential for significant increases in textile imports, primarily apparel, larger U.S. textile exports of yarn, fabric, and semi-processed apparel items should continue to support domestic mill use. Cotton mill consumption is expected to rise 2 to 3 percent per year, surpassing 12.5 million bales by 2000/01. Although below the increases experienced during the previous 5 years, positive growth in mill use is anticipated.

On the other hand, export demand for U.S. cotton is expected to more than offset slowing mill consumption growth. Rising world incomes resulting from increased economic activity will be the driving force behind the growing demand for cotton textile products and raw cotton. With world trade growing between 1996/97 and 2000/01, U.S. cotton exports are projected to average near 7 million bales, as the U.S. share of world trade remains around 25 percent.

With larger total offtake as a result of lower trade barriers, U.S. cotton producers will likely be required to idle less acreage than otherwise anticipated. Despite a projected expansion of the cotton base by nearly a million acres over the next 5 years, relatively low upland cotton ARPs are projected to maintain the legislated stocks-to-use ratios. Cotton area is foreseen below the 1995 expectations, however, planted acreage between 1996/97 and 2000/01 is expected to average over 14 million acres annually.

The national average yield is projected to continue rising near the 25-year trend of approximately 10 pounds per year, reaching 720 pounds by 2000/01. With harvested area around 13 million acres during this period, production is expected to range between 18 and 20 million bales annually. As stocks are rebuilt and adequate supplies are available to meet the rising demand, the U.S. cotton industry will benefit as new opportunities to provide the global market with more cotton and cotton-containing products are presented.

Foreign Outlook

In the years leading out to 2000/01, foreign consumption is expected to grow much closer to its historical rate and by 2000/01, consumption should range between 84 and 88 million bales. Continued steady economic growth in the industrialized countries and robust growth in the

developing world will play an important role in these gains. Also, the economic recovery seen recently in Eastern Europe is expected to spread to the FSU as the difficult transition to market economies progresses. With an improving economic environment, Russia's cotton consumption is forecast to grow during this period, though unlikely to reach its earlier highs.

China's rapid economic growth ensures steady cotton consumption gains there, while pressures from development, industrialization, and competition from other crops mean China's cotton production fails to keep pace. As a result, by 2000/01, China could become a regular large net importer. Southeast Asia is expected to steadily improve its level of cotton consumption and imports. Indonesia should rival Russia as the world's largest importer for much, if not all of this period. The traditional major importers of Japan, East Asia, and the EU are expected to continue losing cotton consumption and imports during this period, but not at the rapid rate seen since the late 1980s.

Like consumption, foreign production is expected to improve, reaching 74-80 million bales by 2000/01. Pakistan's yield growth is expected to resume during this period, although the rapid gains of the 1980's are unlikely to be repeated. Similarly, production in Africa's Franc Zone should continue rising, but at a slowing rate. Turkey is expected to resume net exports as the Southern Anatolian (GAP) irrigation project drives production steadily above consumption. However, most of this larger production will be consumed by Turkish mills. Brazil is expected to remain a net importer as current economic policies opening the economy to external influences remain in place, and cotton production remains well below earlier highs.

As the gap between foreign consumption and production narrows for a few years, the U.S. share of world trade may continue to decline before stabilizing around 25 percent. Gradually improving yields in Central Asia permit net exports by the FSU to rise for a time, although FSU consumption begins picking up closer to 2000/01. India and Pakistan are expected to return to net exporter status, with exports growing over the forecast period, and normal weather should permit Australia to increase its exports.

There are, of course, significant uncertainties surrounding these forecasts. Slower economic growth or unanticipated changes in consumer preferences could change the outlook for consumption. The reforming economies of the FSU and China are particularly difficult to forecast with respect to either consumption or production.

Similarly, the reforms of the world trading system under the recent GATT agreement add a further degree of uncertainty as the agricultural provisions affect competing crops and the textile provisions affect the location of cotton consumption. The relaxation of quotas under the Multi-fiber Arrangement (MFA) is assumed here to largely take effect after 2000/01, but the timing and degree of impact will depend on how the agreement is implemented by the member countries and the new World Trade Organization.

U.S. COTTON SUPPLY AND DEMAND

Item	1994/95	1995/96
		Million acres
Planted	13.7	15.7 - 16.2
Harvested	13.3	14.5 - 15.0
		Pounds
Yield/Harv. acre	710	650 - 670
		Million 480-lb. bales
Beginning Stocks	3.5	2.7
Production	19.7	19.5 - 21.0
Total Supply	23.3	22.2 - 23.7
Domestic Use	11.1	11.2 - 11.7
Exports	9.6	7.5 - 8.5
Total Use	20.7	18.7 - 20.2
Ending Stocks	2.7	3.0 - 4.0

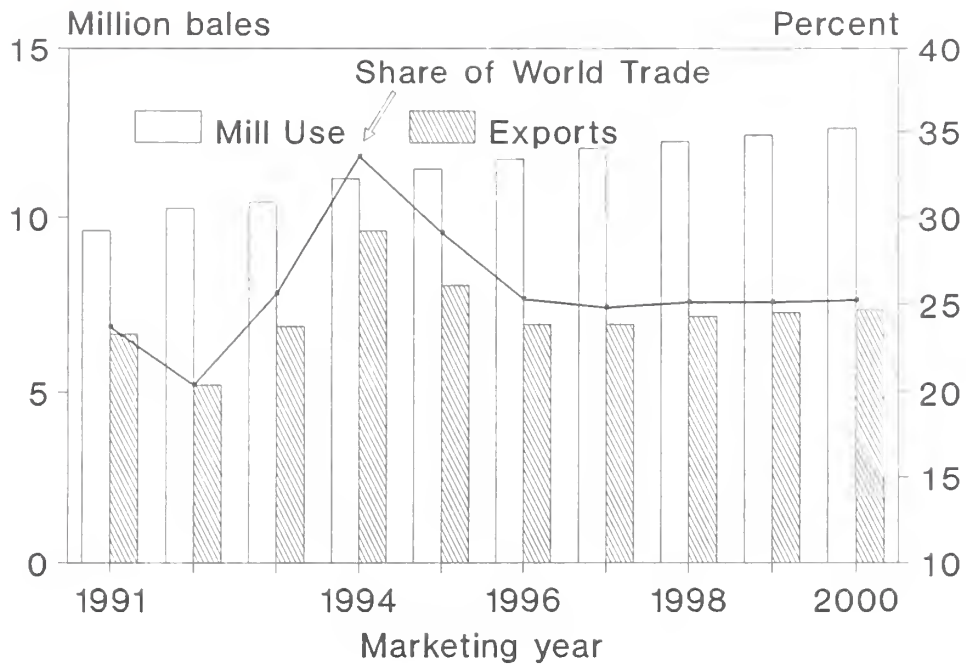
Based on February 1995 estimates.

FOREIGN COTTON SUPPLY AND DEMAND

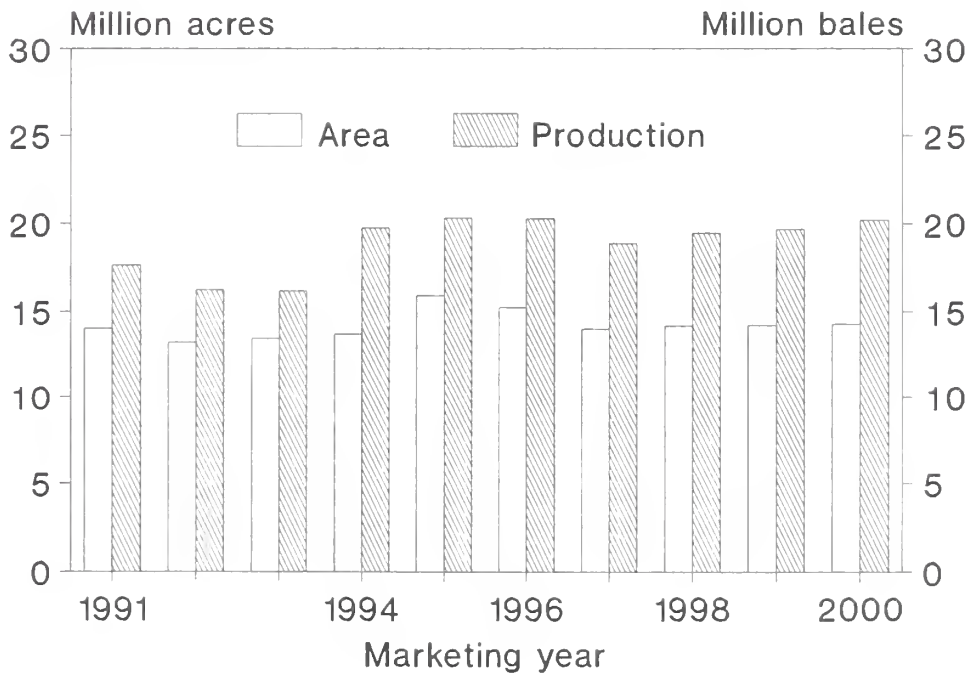
Item	1994/95	1995/96
		Million hectares
Area	26.9	28 - 29
		Kilograms
Yield/hectare	521	520 - 550
		Million 480-lb. bales
Beginning Stocks	26.6	27.5
Production	64.3	65 - 75
Imports	29.8	26 - 30
Total Supply	120.7	118 - 132
Domestic Use	73.9	72 - 78
Exports	19.0	18 - 22
Total Use	92.9	90 - 100
Ending Stocks	27.5	28 - 32

Based on February 1995 estimates.

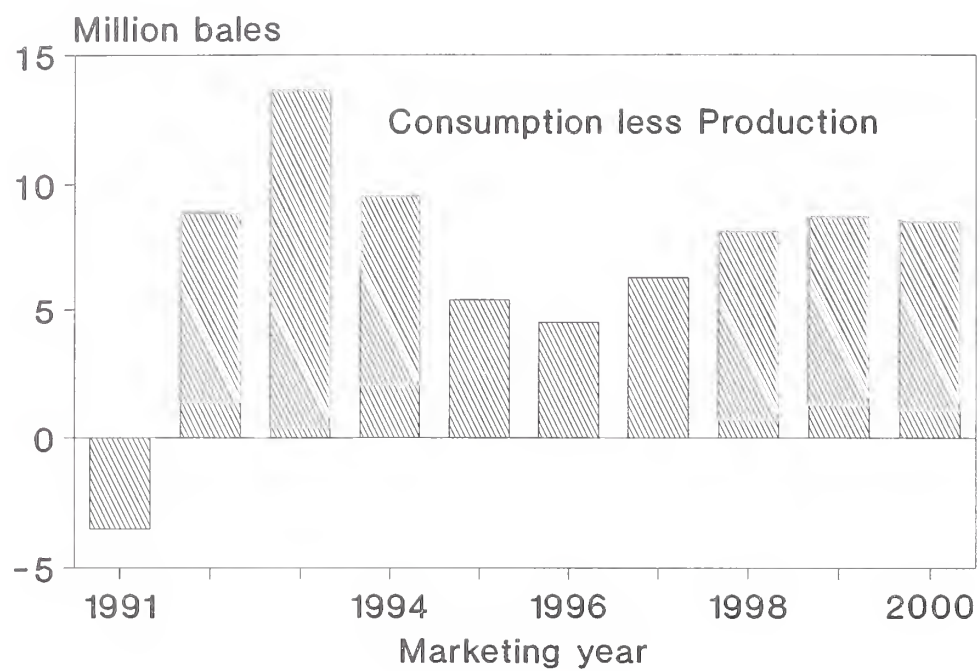
U.S. Cotton Demand Outlook



U.S. Cotton Supply Outlook



Foreign Cotton Outlook



U. S. COTTON EXPORTS--BOOM NOW, BOOM LATER?

Dewell R. Gandy
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U.S. Exports 94/95

Our projection for U.S. Exports of 9.85 million bales for 1994/95 comes about mainly due to a decline in production prospects in key world exporters of the Former Soviet Union, India, Pakistan, Australia and Egypt. Although the crop improved some this season in PRC, it is still short of matching consumption, thus creating additional large import needs. Other exporting countries whose crops have done well this season are supplying additional exportable supplies to the market; they include Argentina, Greece and the Group known as French West Africa.

To highlight some key shortfalls this season, we should start with production problems which continued this year in Pakistan where there was concern about impact from leaf curl virus attack from the previous season. However, a shift in varieties kept this problem at a minimum but another problem developed with aphids and bollworms which kept Pakistan production from recovering; thus production will be lower than the 1993 crop.

In PRC, after a tough year in 1993 with bollworms showing more resistance to pesticides; the problems continued this season. The early bollworm problems were much lighter this season but the 4th and 5th generation bollworms late in the season caused damage that kept the crop from reaching early season projections although production will be above last years level.

In India, early season optimism concerning the crop turned downward as major problems with aphid and bollworms surfaced in Northwest India along the Pakistan border and unusually heavy rains in Central India created insect problems and less fruiting than normal.

In the Former Soviet Union, the Asian republics had an early crop but as harvest began rains also began and the crop ended up way short of early on optimism. Australia has continued to be plagued by drought and acreage is down and yield prospects are down.

If we construct a table to look at the net exportable supplies in 1993 from the major exporters and then project the reductions in exportable supplies for 1994 based upon previously mentioned production problems and look at the net additional import needs in some areas for 1994; then reduce these totals by the added exportable supplies from countries where production expanded in 1994, we come up with nearly 3.0 million bales of additional cotton exports needed, which will have to be supplied by the U.S. Last year U.S. exports were 6.85 million bales; therefore if we add 3.0 million bales to that total, it generates over 9.85 million bales of exports for the U.S. (Table 1.)

The question becomes can we physically export 9.85 million bales this season? The answer should be yes. If you look at the volume of exports August-January, we are shipping at an annualized rate between 9.0 - 9.5 million bales. However the largest volume of shipments based on sales should come in the February-April period. During this period we must ship at 1.0-1.3 million bales per month to have a chance to make the estimate. Also we expect the May-July period shipments to hold well above seasonal trends for those months. Strong shipments should continue into the early part of the 1995/96 season as total sales may conceivably exceed 11.0 million bales and these roll-over sales must be shipped in the first few months to earn export certificate value.

U.S. Exports 95/96

Our projection for U.S. exports of 8.5 million bales comes about due to recovery in production prospects in most major exporting countries. Under this scenario we are projecting world production slightly over 90 million bales and world consumption at near 88.0 million bales. This should reduce the needs of exports from the U.S. by 1.35 million bales from the previous year's 9.85 million bales (Table 1.).

In PRC we look for area to expand to 6.0 million hectares and if there is no major outbreak of bollworms, production should match consumption. However due to their low stock level there will still be a need for large imports in 1995.

In India and Pakistan area should increase between 3 to 6 percent but yields may not recover dramatically due to continued insect and disease problems and a lack of infrastructure to respond rapidly. Thus, look for only marginal increases in production.

In the Former Soviet Union, area should be unchanged with production only marginally higher, but due to a large stock drawdown from last season they may still have significantly less exportable supplies available.

Australian production recovery will depend upon the water availability prior to next seasons planting, while in Brazil we do look for a strong recovery in production which should reduce their import needs substantially.

We look for the French West African countries to hold or expand area in 1995, however if you assume a more normal trend yield versus the excellent yields this season, then this area will still supply less exportable cotton to the market in 1995.

Outlook to 2000

Lets now look ahead to potential longer term prospects. To do this I quote from a paper given by Russ Barlowe to the Cotton Economic Conference, San Antonio, TX Jan. 6, 1995. "The most important factor affecting future global supply and demand developments will be consumer textile demand. As usual, retail demand for textile products will be influenced primarily by growth in population and income. World population is expected to continue increasing at about a 1.7 percent annual rate. Income growth also is expected to increase moderately. A consensus of international forecasts calls for global economic growth to further recover in 1995 and average nearly 3 percent annually during the balance of the 1990's, about equal to the rate of the 1980's. A recent OECD report was unusually upbeat in its assessment of the world economy, noting prospects for steady growth and low inflation. This scenario suggests that textile fiber consumption should improve in 1995 and average close to the long-term growth rate of 2 to 2.5 percent for the balance of the decade." After reviewing several different sources, I feel these projections seem to be the general consensus of where population and world economic progress are headed. There are three developments in three different areas which I would like to highlight, which, if they occur could mean the long-term growth rate of 2 to 2.5 percent projected above might need to be adjusted upward to 3 to 3.5 percent.

First, PRC consumption has been stagnant the last few seasons. This has been due in part to government policy and a lack of supplies to keep mills running consistently. SSB in a recent policy report projection to the year 2000 has indicated a 5 million bale increase in consumption is planned for the economy. This would be a 4 to 5 percent growth per year which seems to be a realistic goal.

Second, the Former Soviet Union had a consumption level in the mid 80's of 9.5 million bales and now, only 10 years later, and with the breakup of the Soviet Union, consumption has dropped to near 3.7 million bales for 1994 and is projected at 3.85 million bales in 1995. If, in fact, we are witnessing a slight turn around in this precipitous decline, would it not be possible to see a return to 5.5 million bales by the year 2000?

Finally, Eastern European consumption has declined from 3.2 million bales in the late 80's to near 1.3 million bales in 1992. Consumption has grown slightly the last 2 years and is projected to be up near 1.55 million bales for 1995. Again, we are witnessing a turnaround in the previous trend of declining consumption. Would it not be possible to see a return to 2.5 million bales of consumption by the year 2000?

If projections of economic growth in the world create a more favorable environment for the above developments to occur and we are still looking at the rest of the world consumption increasing at 2 to 2.5 percent then it is possible that world consumption over the next 5 years could grow at 3 to 3.5 percent per year. This would put world consumption in the range of 100-105 million bales by the year 2000.

We would expect global cotton production to expand as consumption increases, meaning output should also reach 100-105 million bales. Increases may have to come more from yield increases as opposed to additional area as population growth demands more land for food crops. The U.S. and PRC are expected to remain the largest production countries, producing well over 22.0 million bales each by the year 2000.

For the long term trend for world trade I would again like to quote from the paper referenced earlier by Russ Barlowe. "We foresee only modest growth in global raw cotton trade over the next few years as major producing countries such as China, Pakistan and India are expected to continue to channel production into domestic use and textile export markets. This would imply continued sluggish import demand by traditional importing countries in Asia and Europe. World imports as a share of consumption trended down from more than 40 percent in the early 1980's to the low 30-percent range in the early 1990's. A continuation of this trend during the next several years would restrict growth in future trade. By the end of the decade, imports are projected at 29 to 31 million bales, up from nearly 28 million currently."

I would also like to give credit to Steven MacDonald (USDA-ERS) and Carolyn Whitton (USDA-ERS) from earlier work done for a paper entitled World Cotton Trade: Prospects and Issues for the Next Decade as this served as a good source of review. I

agree that growth in trade will be restricted for the same reasons they give and I also agree with the projected range of global raw cotton trade by the year 2000 at 29 to 31 million bales.

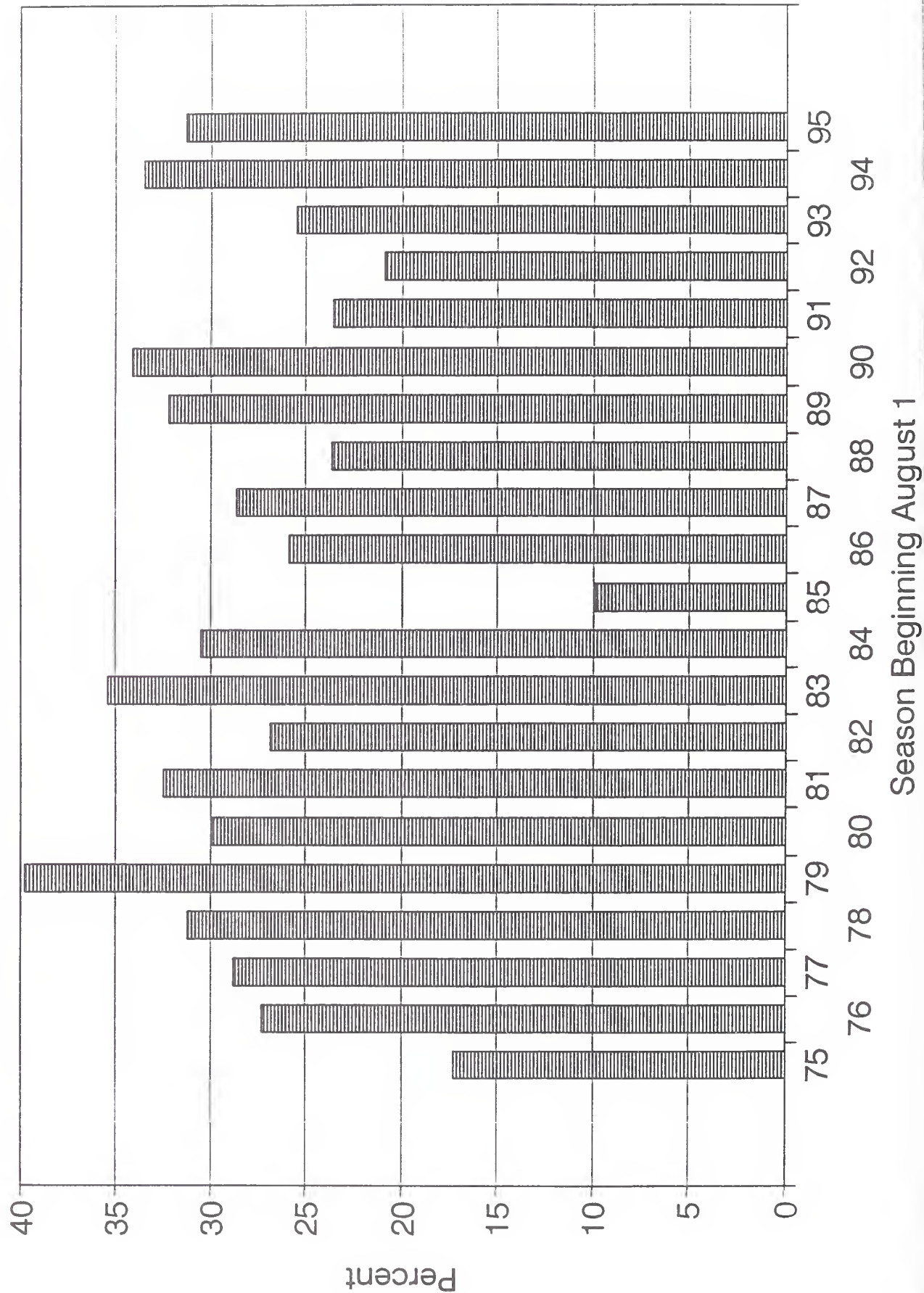
If we then look at U.S. exports as a percentage of world trade. in 1994 we are using 34.0 percent and for 1995 we are using 31 percent (Chart 1.). As we move out to the year 2000 I would expect the U.S. percentage share to be between 25 and 30 percent normally and in years where we experience shortfalls in production from other major exporters we could see U.S. share between 30 and 35 percent as we are experiencing now. This would imply U.S. exports in a range of 7.25-9.25 million bales normally and in years of shortfall by other major exporters it will not be unreasonable to expect U.S. exports of 10.0 million bales.

In summary, looking at world population projections and world economic growth projections, I am more optimistic about U.S. exports staying on a higher level over the next 5 years as opposed to the Boom-Bust cycles that we have seen in the past.

Table 1. Net Exports by Major Exporting Countries 1993,94,95

<u>Net Exports</u>	<u>93</u>	<u>94</u>	Diff. vs <u>93</u>	<u>95</u>	Diff. vs <u>94</u>
	---- 000 480 lb. bales ----				
FSU					
(Net External)	6823	6510	313	5687	823
PRC	-95	-2162	2067	-1592	-570
India	91	-417	508	-15	-402
Pakistan	-22	-588	566	0	-588
Australia	1530	985	545	1400	-415
Egypt	500	28	472	40	-12
FR. W. Africa	2219	2689	-470	2507	182
Greece	582	875	-293	815	60
Argentina	562	1025	-463	1120	-95
Brazil	-1710	-1650	-60	-1200	-450
Turkey	-42	-150	108	-225	75
Others	-	-	-299	-	42
			2994		-1350
U.S.	6856	9850	-2994	8525	-1350

U.S. EXPORTS PERCENTAGE SHARE OF WORLD TRADE



U.S. Sugar Market: Recent Trends, Current Situation, and Outlook to the Year 2000

USDA Agricultural Outlook Forum Sweeteners Session

February 23, 1995
Arlington, Virginia

by

Peter Buzzanell and Ron Lord¹

Introduction

Ladies and gentleman, my colleague Ron Lord and I are honored to present USDA's analysis of recent trends, the current situation, and projections for the U.S. sugar market. The U.S. sugar market continues to be dynamic both in terms of size and structure. U.S. sugar is not only an important part of the U.S. agricultural sector, but it is also a pivotal segment to the global sugar economy in terms of production, consumption, and trade. Like most countries, there is considerable Government intervention in the U.S. sugar market--a loan program, tariff-rate import quota, and provisions for marketing allotments--which affects domestic prices as well as U.S. producers and consumers and foreign exporters.

U.S. sugar production (including Puerto Rico) for fiscal year 1995 is forecast at a record 8.24 million short tons, raw value. Only the expected output in the combined European Union (EU) countries, India, and Brazil are forecast to be higher. Moreover, U.S. sugar production with major components of sugarbeet and sugarcane outrank the only other major dual producer, China, by 40 percent.

U.S. sugar consumption ranks third in the world behind India and the EU. The U.S. has the world's third largest population of 263 million and the largest and most diverse food processing industry. Despite a trend toward greater self-sufficiency in production, the United States remains one of the world's largest net sugar importers--only the Russian Federation and Japan are higher. In addition, U.S. stocks form a significant share of global stocks, 7 percent at the beginning of 1994/95, with only the EU and India higher, and comparable to Russia's.

This large and diverse industry is also very dynamic in its composition. To assess where the industry is headed, we trace recent trends, examine the current situation for fiscal 1995, and project to the year 2000.

Underpinning this analysis is USDA's current and historical sugar data base, updated and critiqued regularly by the various agencies of the Department. The projections are developed through USDA's Interagency Baseline Process (see page 8).

Beet Sugar Production

Recent Trends

Beet sugar production has expanded from around 3.0 million tons annually in the early 1980's to an average 4.1 million in the early 1990's, up by one third. The beet sugar production growth trend is 137,000 tons per year

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over fiscal 1983-1994 (figure 1).² Sugarbeet harvested acreage has expanded by over 200,000 acres from 1.2 million in the early 1980's to 1.4 million in the early 1990's. While some areas have experienced a decline, notably California, this has been more than offset by expansion in the Upper Midwest.

To accommodate the expanded area, U.S. beet processing firms have increased slicing capacity (tons of beets per day) to an average of 5,374 tons per factory, up by one-third from the early 1980's. In contrast to higher acreage and capacity, sugarbeet yields have not trended upward, but vary widely from year to year due to weather. However, sugar per acre has been rising, reflecting the growing of beet seeds bred for high sugar content, improved management techniques by farmers, and improved processing technology. Processors have provided incentives to growers to raise crop quality (sugar versus tonnage). The improved management of nitrogen has been pivotal to this effort. Too much nitrogen costs growers twice--extra cost for unneeded inputs, and lower extractable sucrose which reduces crop returns.

Current Situation

Beet sugar production for fiscal 1995 is forecast at a record 4.65 million tons, up 14 percent or 560,000 tons from last year (table 1).³ Sugarbeet production is estimated at a record 32.0 million tons with national yields and acreage harvested estimated at 22.2 tons per acre and 1.44 million acres, respectively. The improved outturn largely reflects higher production in Minnesota and North Dakota with sugarbeet production estimated at 12.74 million tons, 40 percent of the national crop, and up 51 percent from last year. Beet sugar production from the desugaring of molasses (included in the total forecast) is expected to total 235,000 tons from 6 facilities now in operation, compared with under 50,000 tons from 1 facility just 5 years ago.⁴

Early indications are that sugarbeet acreage planted this spring for the 1995/96 crop will be about unchanged from 1994/95. While some areas are expected to expand somewhat, such as California, most other areas are expected to remain unchanged or perhaps decline slightly reflecting the prospects of stock carry-over due to marketing allotments and capacity constraints at factories. In Texas, sugarbeet acreage will remain depressed because high cotton prices are likely to encourage farmers to plant more cotton. USDA's survey-based estimate of 1995/96 planting intentions will be released March 31, 1995.

Outlook to 2000

Sugarbeets, while more expensive to grow, are generally more profitable than alternative crops in most areas where they are grown, and under the current sugar program are expected to remain more profitable. Sugarbeet acreage harvested is projected to rise from 1.45 million acres in 1995 to 1.55 million in 2000, up about 20,600 acres per year. Sugarbeet yields are projected stable, while the beet sugar recovery rate will rise gradually on trend.

According to USDA's most recent baseline projection, total beet sugar production rises about 90,000 tons a year, reaching 5.02 million tons in 2000 (figure 7). This compares with production of 3.47 million tons in 1990 and 3.23 million in 1980 (table 2). Projected sugar from the desugaring of beet molasses rises to 350,000 tons by 1997, an amount equivalent to 120,000 acres of sugarbeets.

²Note that fiscal 1995's record crop is not included in the base used to establish the trend.

³Current estimates are based on the February 11, 1995 World Agricultural Supply and Demand Estimates (WASDE) report. The sugar estimates and analysis contained in this report are developed by USDA's Interagency Sugar Estimates Committee.

⁴Desugaring molasses raises total sugar recovery from sugarbeets by about 10 percent.

The beet sugar industry would expand even more rapidly, but investment is likely to be constrained somewhat by the risk of marketing allotments. Under USDA assumptions, beet sugar's share of total domestic sugar production continues to grow from 52 percent in 1990, to 56 percent in 1995, and 60 percent in 2000. However, this assessment might understate potential expansion in light of emerging news of investment programs by beet processors, such as the US\$63 million expansion program recently announced by a farmer owned cooperative in the Upper Midwest that will boost its factory slicing capacity 27 percent and acreage 37 percent by the late 1990's.

Cane Sugar Production

Recent Trends

Cane sugar production grew at a trend rate of 32,000 tons per year during fiscal 1983-1994 (figure 2). Over this period national acreage has expanded by 200,000 acres, led by Florida and Louisiana. In contrast, Hawaiian and Puerto Rico acreage has declined.

Florida has displayed strong production growth, underpinned by expanded area and generally improved yields and recovery rates. Production rose from 1.2 million tons in the early 1980's to 1.8 million in the early 1990's. Louisiana has experienced freezes, hurricanes, and periodic poor growing and harvesting weather, but acreage has been trending up. Texas has made incremental improvements in its field and factory efficiency and also has had production at record levels in recent years.

Hawaii's annual production has fallen from 1.0 million tons as recently as 1987 to 660,000 tons last year, down one-third. The contraction in production and acres harvested is attributed to the closure of mills due to high costs and poorer yields. Puerto Rico's sugar production has declined from over 1 million tons in the 1950's to less than 50,000 tons this season. The government-owned industry is no longer cost-competitive.

Current Situation

Cane sugar production for fiscal 1995 is forecast at 3.59 million tons, marginally above last year. Louisiana's production is a record 1.02 million tons (the grinding season in Louisiana ended January 2). Louisiana's sugar industry has rebounded sharply from the severe freeze which cut 1990/91 output to 480,000 tons, less than one-half of this season's record. The dramatic upturn in fiscal 1995 is attributed to improved yields and near-record acreage harvested for sugar.

In sharp contrast, the production forecast for Hawaii is 540,000 tons, down 23 percent from the estimate for fiscal 1994. The downturn is explained by the permanent closing of three mills due to high costs, and the shift of acreage servicing the mills out of sugarcane. Florida, the nation's largest cane sugar producing state, is expected to produce 1.84 million tons, 51 percent of the U.S. cane sugar forecast. Heavy rains the last few months have slowed grinding, but yields are not expected to be affected. Florida's cane grinding season runs into April.

Outlook to 2000

Sugarcane acreage is projected to decline slightly from 1995 to 2000. National average cane yields, which have been falling due to loss of high-yielding Hawaiian acreage, may increase slowly as research and development of better varieties proceeds and Hawaii's acreage stabilizes. The cane sugar recovery rate should rise on trend. For Texas, Louisiana, and Florida, cane sugar production is expected to remain stable or grow slowly with production projected at 140,000 tons, 930,000 tons, and 1.79 million tons, respectively. Hawaii's sugar production is expected to decline to 430,000 tons. Puerto Rico's production is expected to continue its contraction, dipping to 30,000 tons by 2000 (figures 8, 9, 10).

Cane sugar faces less risk from the current program's marketing allotments than beet sugar, since even if triggered (using current formula), the marketing allotment for cane sugar is more likely to exceed actual production. Cane sugar production is expected to total 3.33 million tons in 2000, 40 percent of domestic production. This compares with 3.12 million in fiscal 1990 and 2.88 million in 1980 (includes 153,000 tons in Puerto Rico).

Sugar Consumption⁵

Recent Trends

During the first half of the 1980's, sugar lost 2 million tons of the beverage market to lower-cost HFCS. Since 1986/87, with maturity of the HFCS market, sugar use has rebounded by 1.8 million tons (annually averaging 2.0 percent growth or 169,000 tons per year). This resurgence largely reflects population growth (0.9% per annum), increases in immigrant population (many of whose traditional diets are high in sugar), expansion of away-from-home food consumption, and increases in use by food processors (especially the baking/cereal and confectionery sectors--up 37 and 26 percent, respectively, 1986-1994) (figures 3 and 4).

Beet sugar deliveries have grown by over 700,000 tons from 1986/87 through 1993/94 capturing a 46 percent share of total sugar use in the early 1990's, compared with 33 percent in the early 1980s.

Current Situation

U.S. sugar consumption in fiscal 1995 is forecast at 9.43 million tons, compared with 9.33 million last year. The year-to-year growth is up 1.0 percent or 97,000 tons. Underpinning this anticipated growth is expected strong demand for sugar from the bakery and cereal industries. For calendar 1994, deliveries to this use category totaled an estimated 1.96 million tons, refined, up 10.1 percent from the year before, and 40 percent of total industrial use.

The anticipated growth also reflects projected income and population growth. Per capita sugar deliveries for food and beverage use are forecast at 64.9 pounds, refined basis, for fiscal 1995, down fractionally from 1994, but trending up since 1986.⁶ The rapid substitution of corn sweeteners for sugar ended about 1986, after which per capita sugar use has been on the rise, though the rate of increase has slowed since fiscal 1991.

Outlook To 2000

The projected growth rate of sugar consumption (1995 through 2000) is about 1.5 percent a year, down from the recent 2 percent average, due to constraints on the ability of sugar to continue to displace other foods. An industry sugar promotion campaign which promoted its "naturalness" has ended for the moment, but sugar continues to benefit from increased public emphasis on the negative nutritional aspects of fats.

Per capita sugar consumption for food and beverage use is forecast to rise to 67.1 pounds, refined basis, in 2000. Domestic sugar disappearance is expected to rise about 150,000 tons per year from 1995 to 2000 (down from 169,000 in recent years) due to population and per capita use growth. Total sugar use is likely to reach 10.19 million tons in 2000, up from 8.90 in fiscal 1990 and above the 9.95 tons achieved in 1980 (figure 11).

⁵USDA uses sugar deliveries from manufacturers to first users as a surrogate for actual consumption data. Data are raw value, unless otherwise specified.

⁶This analysis is based on an estimate of the U.S. population (including Puerto Rico) of 267.3 million for fiscal 1995. U.S. population is projected at 275.6 million for the year 2000.

Sugar Trade

Recent Trends

The U.S. remains one of the world's largest sugar importers, but imports for consumption have generally contracted as the gap between total domestic consumption and production has narrowed (figure 5). During the 1980's, quota sugar imports dipped from 3.0 million tons to a low of 874,000 tons in fiscal 1988. The Food, Agriculture, Conservation and Trade Act of 1990 has had the effect of putting a floor on the quota of 1.25 million tons.

USDA's sugar reexport programs has allowed refiners and manufacturers access to world-priced sugar for refining and reexport in the form of refined sugar and sugar containing products. Quota-exempt imports for reexport averaged 489,000 tons annually between fiscal 1983 and 1994 and ranging between 550,000 and 650,000 tons the last 5 years. U.S. exports of refined sugar, largely from quota-exempt imports, have ranged between 189,000 and 627,000 tons depending on foreign demand and pricing levels (1983-94). The transfers of refined sugar to manufacturers of sugar-containing products for export is a small, but rapidly growing outlet--forecast at 160,000 tons for fiscal 1995 compared with an average of 94,000 tons the previous 5 years.

Current Situation

For fiscal 1995, the United States is forecast to remain a large net sugar importer, with imports expected to be over three times as large as exports. Total imports for fiscal 1995 are forecast at 1.97 million tons, compared with exports of 510,000 tons. Estimated total imports for fiscal 1995 consist of 1.46 million tons of tariff-rate quota (TRQ) imports, 450,000 tons of quota-exempt raw sugar for processing and reexport, 50,000 tons of beet sugar from Canada and under the high tariff, and 15,000 tons of quota-exempt imports for polyhydric alcohol.⁷ Forecast imports under the TRQ for fiscal 1995 assume a shortfall of 120,000 tons.

The current import quota system allows entry at the rate of 0.625 cents per pound, raw value basis. The duty is waived for sugar from beneficiary countries including Caribbean Basin Initiative (CBI), Andean Preference, and most Generalized System of Preferences (GSP) countries except Brazil. Within quota duties paid may be eligible for U.S. Customs drawback, if sugar is re-exported. Any non-quota raw sugar entering the United States for consumption is subject to a duty of 17.62 cents per pound.

Outlook To 2000

The gap between domestic sugar consumption and production is projected to widen over the next 5 years (figure 12). As a result, if the TRQ is managed as in the past, imports for consumption are forecast at 1.25 million for 1996, then at 1.66 million tons for 1997 and 1998, and at 1.72 million in 2000. Quota-exempt imports are expected to remain at 600,000 tons with reexports of refined sugar and sugar in sugar-containing products mirroring the level of imports.

NAFTA, implemented on January 1, 1994, does not affect the trade forecast through 2000 but could affect the U.S. market after the year 2008 when all barriers to sugar trade between the United States and Mexico are ended. The implementation of the new Uruguay Round GATT Agreement will not change the basic features of U.S. sugar imports or exports. The two-tiered TRQ system will remain in place, and the low duty applicable to in-quota imports will be unchanged. The second-tier duty of 16 cents a pound, raw value, is changed to 17.62 cents a pound in 1995 and will be phased down to 15.36 cents a pound by 2000. The import fee on refined

⁷As indicated in the February WASDE, imports under quota in 1993/94 were adjusted downward by 133,000 tons because of a revision in the data received from U.S. Customs. This results in a higher estimate for sugar available for entry under quota in 1994/95.

sugar of 1 cent per pound (whether in-quota or not) has been incorporated in tariff rates for all TRQ imports other than raw sugar.

Also under the Uruguay Round, the United States bound the import quota (low-duty) of 1.256 million short tons, raw value, annually, comprised of 24,000 tons of refined sugar, raw value, and 1.232 million tons of raw sugar. For the period January 1 1995 to September 30, 1995, Canada has a quota of 8,000 metric tons, raw value to be entered as refined sugars which are originating goods of Canada. This quota has already been filled. Mexican and Canadian sugar imports will be counted as part of the TRQ in fiscal 1996. Canada's shares of the quota after October 1, 1995 has not been announced.

Sugar Prices and Stocks

Recent Trends

Grower prices for sugarcane derive from the raw sugar price, which has been based on a cane sugar loan rate of 18 cents a pound, raw value, during the life of the 1985 and 1990 Farm Acts. Since fiscal 1983, monthly average U.S. raw sugar prices (New York Contract No. 14) have ranged from a high of 23.29 cents in fiscal 1990 to a low of 20.46 cents in 1986, a spread of 2.83 cents. In contrast, during this 11-year period, annual average world raw sugar prices ranged from a high of 13.67 cents in 1990 to a low of 3.76 cents in 1985, a spread of 9.91 cents (figure 6).

USDA's sugar price "model" utilizes stocks-to-use estimates in order to forecast price (i.e. for every percent change in the stocks-to-use ratio there is a 0.36-cent change in raw sugar price). The model has worked reasonably well in forecasting 3rd quarter raw sugar prices, though less reliably in recent years.

Grower prices for sugarbeets are typically based upon the net return from processors sales of sugar. Contracts specify that processors may deduct from gross returns certain expenses, such as shipping and handling, marketing, storage, taxes, insurance, and freight to calculate the net return.

Current Situation

The raw sugar price averaged 22.05 cents a pound in fiscal 1994 versus 21.49 the year before. Prices averaged 21.83 cents for the first quarter of fiscal 1995 (October-December), 22.65 for the month of January and 22.71 cents for the first 10 days of February. Wholesale refined beet sugar prices (f.o.b. plant, Midwest markets) averaged 25.60 cents for fiscal 1994 and 25.00 cents October-December 1994. Wholesale prices for January averaged 25.50 cents per pound and have remained at that level through the first 10 days of February.

The ending stocks-to-use ratio for fiscal 1994 was 13.6 percent. The fiscal 1995 stocks-to-use ratio, based on USDA's February 10, 1995 WASDE release, is forecast at 16.2 percent. Ending stocks on September 30 are forecast at 1.61 million tons. This includes approximately 258,000 tons of beet sugar and 53,000 tons of cane sugar in excess of marketing allotments. The stocks-to-use ratio without the "blocked stocks" would be 13.1 percent.

Stepped-up U.S. exports under the re-export program, expectations for increased U.S. sugar deliveries during the second half of the year, a slowdown in U.S. sugar imports, and restrictions on domestic sugar marketings have bolstered raw sugar futures prices somewhat in the past several weeks.

Outlook To 2000

From 1995 through 2000, the stocks-to-use ratio is forecast at 13.5 percent, and the raw sugar price at 22.10 cents a pound, a price consistent with the implementation of the sugar program in recent years.⁸

The raw cane sugar loan rate, assuming no change in the U.S. sugar program, remains at 18 cents a pound, raw value, to 2000. The 1994/95 beet sugar loan rate was recently announced at 23.43 cents a pound, refined basis, and is projected at 23.42 cents after 1996.

Legislation provides for domestic marketing allotments to be imposed if estimated imports fall below 1.25 million short tons, raw value. Domestic marketing allotments were imposed for fiscal 1993 at the beginning of the 4th quarter of fiscal 1993, and for fiscal 1995. Allotments are projected in the baseline for fiscal 1996, but not subsequently. However, normal variations of production and consumption would likely result in import needs dropping below the 1.25 million-ton trigger level sometime in the forecast period.

Conclusions

Recent Trends and Current Situation

Improvements in production technologies combined with economic incentives to expand has led to substantial growth in U.S. sugar production, especially for beet sugar. This growth has generally outpaced the expansion in consumption. Reflecting this trend coupled with the guidelines of the 1985 and 1990 farm bill to administer a no-cost sugar policy, USDA has been required to either cut the tariff-rate quota and/or impose marketing allotments. With the quota floor of 1.25 million tons implied by the 1990 Farm Act, USDA can no longer make drastic quota cuts in record production years--e.g. such as a quota of 874,000 tons in fiscal 1988. When the sugar supply-demand shortfall hits 1.25 million tons, USDA must accomplish the no-cost goal (e.g. no forfeitures of sugar under loan to USDA) through marketing allotments.

For fiscal 1995, record production has again outpaced consumption growth. With quota imports at the floor level of 1.25 million tons, USDA imposed marketing allotments October 1, 1994, using the three factor weights of 25 percent (past marketings), 25 percent (processing capacity), and 50 percent (ability to market).

Each quarter the USDA is required to reassess the need for marketing allotments. This was done in late December, when the overall allotment level of 7.89 million tons (4.36 million for beet sugar and 3.53 for cane sugar) was left unchanged. Another quarterly assessment will be done in March. Since October 1, USDA estimates for sugar production (including Puerto Rico) are up 350,000 tons, reflecting the record outturn expected in fiscal 1995, consumption estimates are down 50,000 tons, imports of quota sugar are higher, and non-quota imports for reexport are lower. With marketing allotments set at 7.89 million tons, production in excess of marketing allotments, approximately 310,000 tons, are "blocked" from being marketed domestically. This action along with a sharp upturn in the world price has caused the U.S. sugar market to move to price levels that, if sustained, would avoid forfeitures of sugar loans to USDA.

Meanwhile, world sugar supplies are tight and world prices have risen to levels closer to those in the United States. This changing world market situation has had two effects on the U.S. sugar market. First some foreign exporters are opting to delay export to the United States, especially those quota holders which are net sugar importers. Second, U.S. refiners are exporting domestic sugar under the reexport program and deferring the import of raw sugar to 1996, due to spreads between nearby and distant futures prices. This is reducing the availability of sugar for the domestic market. These events, along with the sugar blocked off the market by marketing allotments, are combining to strengthen domestic cane sugar prices. Some segments of the sugar

⁸Under the baseline, prices are at nominal, not constant-dollar, values.

industry are currently urging the USDA to lift marketing allotments and/or increase the size of the import quota in order to increase domestic supplies and dampen prices.

Outlook to 2000

Again, assuming no change in the U.S. sugar program, USDA projects sugar production in 2000 at 8.35 million tons, up 7.2 percent or 60,000 tons from fiscal 1995 as growth in beet sugar production, up 320,000 tons to 5.02 million, is largely offset by a decline of 260,000 tons in cane sugar to 3.33 million. The growth in beet sugar is largely attributed to expanded acreage, especially in the Upper Midwest, while contraction in cane sugar output is explained by sharply lower production forecasted for Hawaii--despite some new investments and new acreage now expected on the island of Maui--and somewhat lower production in Florida and Puerto Rico. These estimates are USDA's best judgments, given the interaction of variables in our model and overlaid by current intelligence about emerging trends in technology and investments in production capacity. It should be noted that in the past we significantly underestimated the growth in beet sugar output and the decline in Hawaii--we could be wrong again. USDA's 1990 forecast of 1995 production (including Puerto Rico) was 7.6 million tons, compared to current estimates of 8.2 million.

On sugar consumption, USDA foresees expansion from 9.43 million in fiscal 1995 to 10.19 million in 2000, up 8.1 percent or 760,000 tons, accomplished by year-to-year growth of about 1.5 percent a year. USDA has been doing much better with annual consumption forecasts since we began getting monthly data--but our long-run forecasts also have generally underestimated consumption growth (e.g. USDA's 1990 forecast of 1995 consumption, including Puerto Rico, was 8.8 million tons versus the current estimate of 9.4 million). This time we could be too bullish on growth, especially in light of new technologies for substitutes for sucrose or the increased blending of sucrose with other sweeteners--all encouraged by price differentials.

Given USDA forecasts for consumption and production, USDA envisions imports for consumption in 2000 at 1.72 million tons, well above the 1.25 million ton threshold that might trigger marketing allotments. In fact, over the next 5 years we foresee imports at the threshold level only in fiscal 1996. If USDA significantly underestimates production and/or overestimates consumption, new scenarios would have to be developed.

Baseline Projections

The sugar baseline projections in this article are one of several developed by USDA and represent a Departmental consensus on a representative long-run scenario for the second half of the 1990s.

Baseline projections are provided for selected program commodities as well as for aggregate indicators of the sector, such as farm income and food prices. Long-run baseline projections are used internally by USDA to support ongoing Departmental activities such as budget reviews and farm program administration and management. Additionally, baseline projections provide a point of departure for discussion for alternative scenarios, particularly for agricultural policy analyses, such as farm bill alternatives and U.S. export-related scenarios.

The baseline scenario presented in this paper is not a USDA forecast about the future. Instead, it is a conditional, long-run scenario about what would be expected to happen under current agricultural law and specific assumptions about external conditions. Critical assumptions are made about: U.S. agricultural and trade policies; funding for U.S. agricultural export programs; foreign economic, agricultural, and trade policies; U.S. and international macroeconomic conditions; growth rates of agricultural productivity, and normal (average) weather.

U.S. Sugar Market Trends

Figure 1

U.S. Beet Sugar Production

1,000 tons, raw value

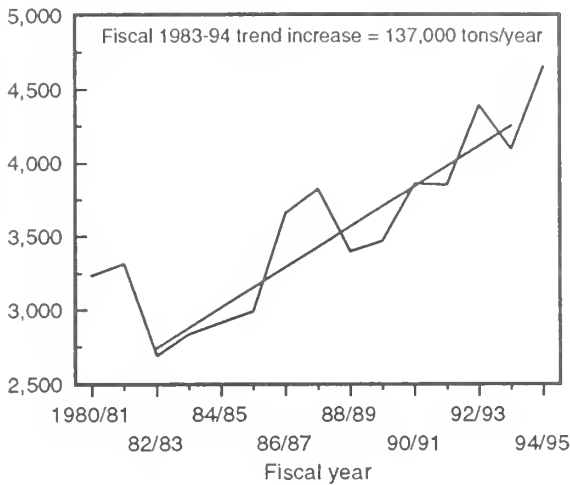
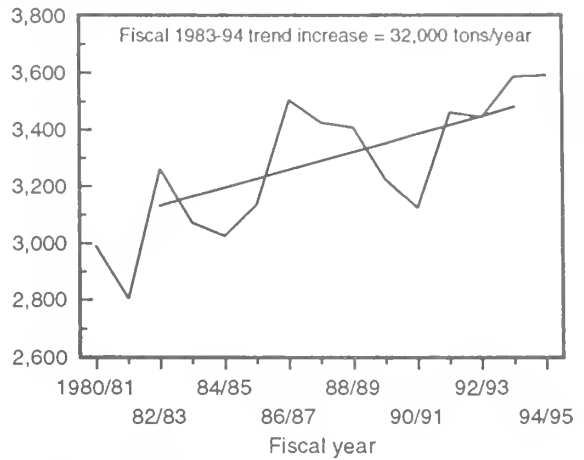


Figure 2

U.S. Cane Sugar Production*

1,000 short ton, raw value

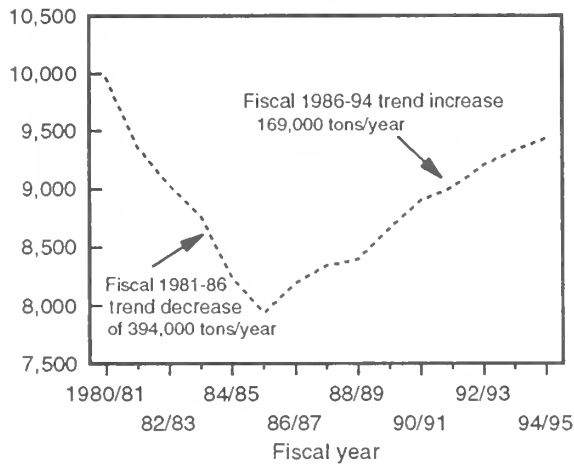


*Includes Puerto Rico.

Figure 3

U.S. Sugar Consumption

Million short tons, raw value



Source: USDA.

Figure 4

U.S. Sugar Deliveries by Type of Major Food Use

1,000 short tons, refined

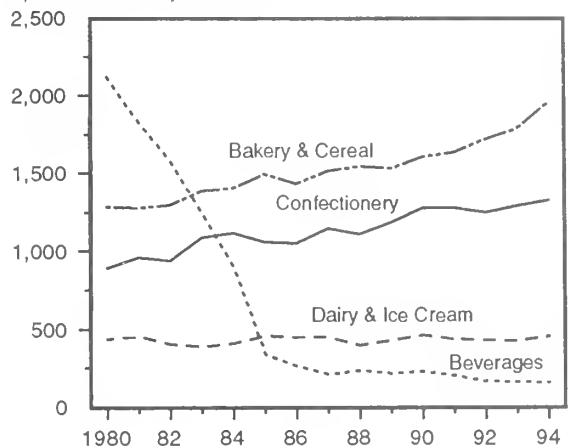


Figure 5

U.S. Sugar Production and Net Imports

Million short tons, raw value

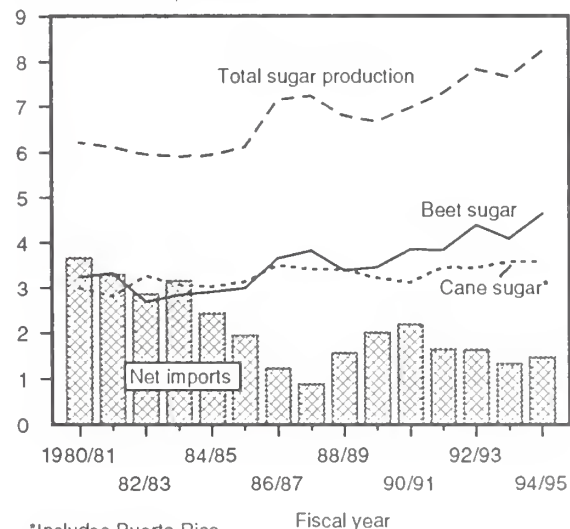
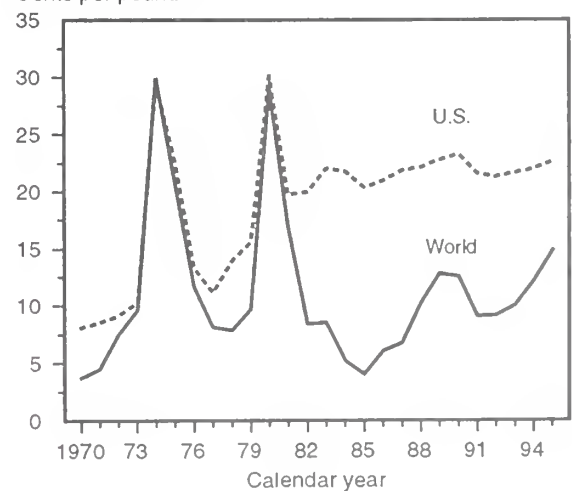


Figure 6

World and U.S. Raw Sugar Prices

Cents per pound



1995 January only.

Table 1—U.S. sugar (including Puerto Rico) supply and use, fiscal years 1/

Items	Five year average 1980/81—1984/85	Five year average 1985/86—1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
1,000 short tons, raw value							
Beginning stocks 2/	1,620	1,504	1,224	1,524	1,477	1,704	1,338
Total production 3/ 4/	6,030	6,805	6,978	7,306	7,838	7,677	8,240
Beet sugar	2,999	3,465	3,854	3,845	4,392	4,090	4,650
Cane sugar	3,030	3,340	3,124	3,461	3,446	3,587	3,590
Florida	1,211	1,494	1,802	1,832	1,710	1,792	1,840
Louisiana	578	728	480	763	876	893	1,020
Texas	89	95	88	109	138	146	145
Hawaii	1,038	932	722	689	658	705	540
Puerto Rico	114	91	74	68	65	51	45
Total imports 3/	3,553	2,005	2,825	2,194	2,039	1,772	1,972
Quota—sugar imports 5/	1,755	1,452	2,298	1,486	1,335	1,046	1,457
Oct.—Dec.	462	357	407	162	171	193	241
Jan.—Sept.	1,294	1,095	1,891	1,324	1,164	853	1,216
Canada and high duty imports	0	0	32	39	40	56	50
Quota—exempt imports for reexport	161	511	599	667	601	641	450
Quota—exempt imports for polyhydric alcohol	0	0					
	6	17	8	10	10	16	15
Statistical adjustments 3/	654	25	-112	-8	53	13	0
Total Supply	11,202	10,314	11,027	11,024	11,354	11,153	11,550
Total exports 3/	475	480	627	554	405	454	510
Quota—exempt for reexport	146	484	706	562	397	430	470
Other exports	304	7	0	0	10	30	40
CCC disposal, for export	0	35	0	0	0	0	0
Statistical difference 6/	25	-45	-79	-8	-2	-6	
Miscellaneous	34	137	-25	-13	48	28	0
CCC disposal, for domestic non—food use	0	25	0	0	0	0	0
Refining loss adjustment	64	31	61	0	0	0	0
Statistical adjustment 4/	-30	81	-86	-13	48	28	0
Total deliveries	9,067	8,303	8,901	9,006	9,197	9,333	9,430
Transfer to sugar—cont. products for exports under reexport program	7	33	59	88	148	138	160
Transfer to polyhydric alcohol	6	17	8	11	15	16	15
Deliveries for domestic food and beverage use	9,054	8,252	8,834	8,907	9,034	9,179	9,255
Total Use	9,576	8,920	9,503	9,547	9,650	9,815	9,940
Ending stocks 2/ 7/	1,627	1,394	1,524	1,477	1,704	1,338	1,610
Privately owned	1,609	1,355	1,524	1,477	1,704	1,322	1,610
CCC	17	39	0	0	0	6	0
Percent							
Stocks—to—use ratio	16.99	15.63	16.04	15.47	17.66	13.63	16.20
Millions							
Population (April 1)	236.98	247.98	255.68	258.48	261.38	264.0	266.6
Pounds							
Per capita sugar deliveries, for domestic food and beverage use, refined basis	71.4	62.2	64.6	64.4	64.6	65.0	64.9

1/ Fiscal year beginning October 1. 2/ Stocks in hands of primary distributors and CCC. 3/ Historical data are from CFSA (formerly ASCS), "Sweetener Market Data".

4/ Production in 1994/95 is Interagency Sugar Estimates Committee. 5/ Actual arrivals under the tariff rate quota with late entries and quota overfills assigned to the fiscal year in which they actually arrived. Forecast imports under quota in 1994/95 assume a short fall of 120,000 tons from the quota covering fiscal years 1993, 1994, 1995. Moreover, projected sugar import quota do not necessarily reflect the determination by the Secretary which will be made pursuant to additional U.S. Note 5 of Chapter 17 of the Harmonized Tariff Schedule of the United States. 6/ Calculated as a residual.

7/ Includes approximately 258,000 tons beet sugar, and 53,000 tons of cane sugar in excess of marketing allotments in 1994/95.

The stocks to use ratio without the "blocked stocks" would be 13.1 percent.

Sources: Interagency Sugar Estimates Committee, USDA. (February 10, 1995)

U.S. Sugar Production and Consumption Projections

Figure 7

U.S. Beet Sugar Production Projection

1,000 tons, raw value

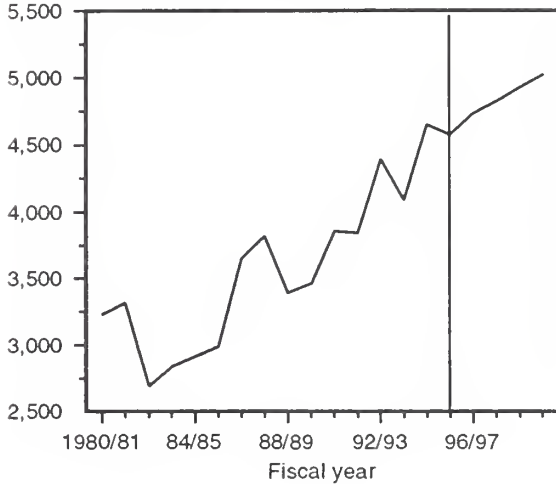
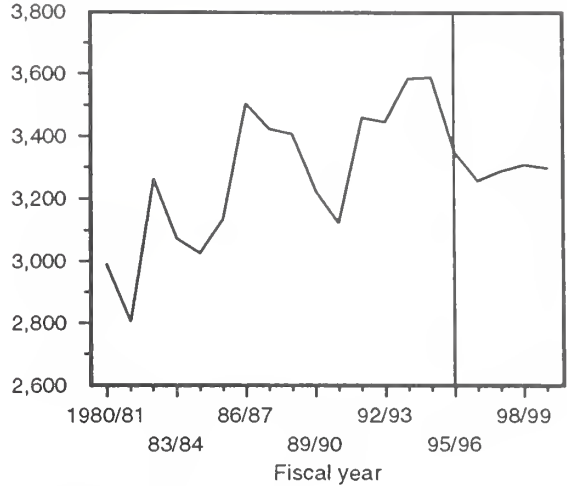


Figure 8

U.S. Cane Sugar Production Projection*

1,000 short ton, raw value



*Includes Puerto Rico.

Figure 9

Florida and Louisiana Cane Sugar Production Projections

1,000 short tons

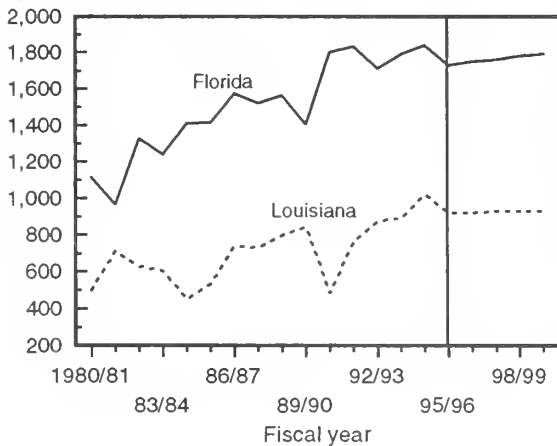


Figure 10

Hawaii and Texas Cane Sugar Production Projections

1,000 short tons

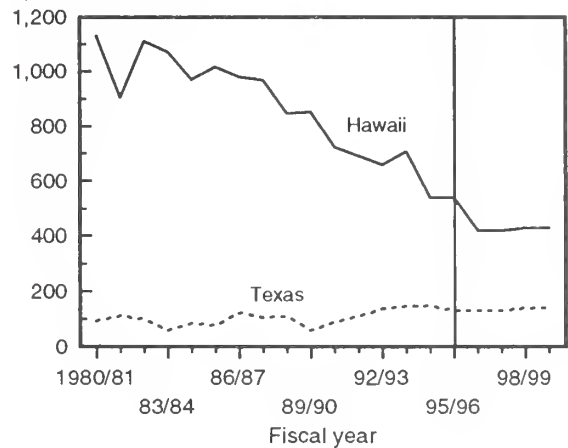
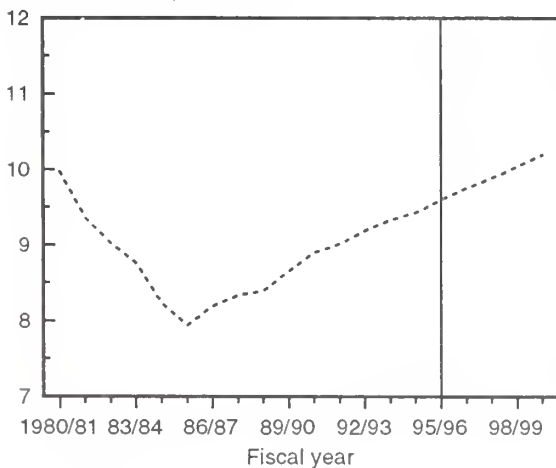


Figure 11

U.S. Sugar Consumption Projection*

Million short tons, raw value

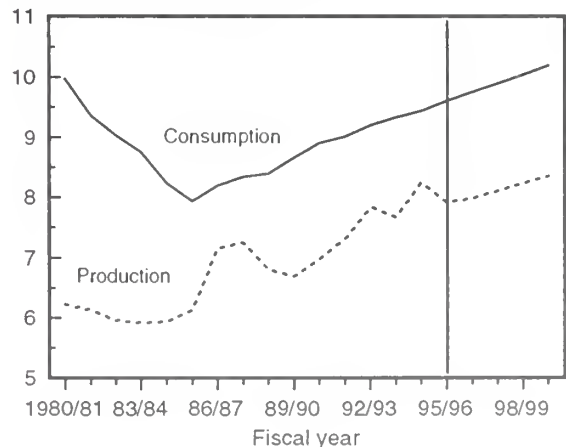


*Includes Puerto Rico.

Figure 12

U.S. Sugar Production and Consumption Projections*

Million short tons, raw value



*Includes Puerto Rico.

Table 2 -- U.S. sugar: supply, disappearance, and prices, baseline estimates, fiscal years 1/

Item	Units	Average 1990/91 - 1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
Beets--Planted	1000 Acres	1,432	1,485	1,515	1,535	1,555	1,575
Harvested	1000 Acres	1,406	1,460	1,490	1,510	1,530	1,550
Yield	Tons/Acre	20.3	20.3	20.3	20.3	20.3	20.3
Production	Mil. S. Tons	28.6	29.7	30.3	30.7	31.1	31.5
Cane--Harvested	1000 Acres	880	908	894	891	888	888
Yield	Tons/Acre	33.5	32.2	31.6	31.8	31.9	32.0
Production	Mil. S. Tons	29.4	29.2	28.3	28.3	28.3	28.4
Supply:							
Beginning Stocks	1000 S. Ton	1,445	1,634	1,344	1,378	1,397	1,418
Production	1000 S. Ton	7,597	7,920	7,990	8,110	8,230	8,350
Beet Sugar 2/	1000 S. Ton	4,176	4,570	4,730	4,820	4,920	5,020
Cane Sugar 3/	1000 S. Ton	3,421	3,350	3,260	3,290	3,310	3,330
Total imports	1000 S. Ton	2,171	1,850	2,255	2,259	2,290	2,320
For consumption 4/	1000 S. Ton	1,575	1,250	1,655	1,659	1,690	1,720
Other imports 5/	1000 S. Ton	597	600	600	600	600	600
Total supply	1000 S. Ton	11,213	11,404	11,588	11,747	11,918	12,088
Use:							
Domestic disappearance	1000 S. Ton	9,181	9,600	9,750	9,890	10,040	10,190
Exports	1000 S. Ton	501	460	460	460	460	460
Surplus exports 6/	1000 S. Ton	8	5	0	0	0	0
Miscellaneous 7/	1000 S. Ton	4	0	0	0	0	0
Total use	1000 S. Ton	9,686	10,060	10,210	10,350	10,500	10,650
Ending stocks	1000 S. Ton	1,527	1,344	1,378	1,397	1,418	1,438
Available stocks 8/	1000 S. Ton	1,392	1,339	1,378	1,397	1,418	1,438
Blocked stocks 9/	1000 S. Ton	140	5	0	0	0	0
Excess domestic supply 10/	1000 S. Ton	146	10	0	0	0	0
Stocks/use ratio 11/	Percent	15.8	13.4	13.5	13.5	13.5	13.5
Raw sugar prices:							
World (No. 11)	Cents/lb.	10.56	10.40	10.70	11.10	11.40	11.80
N. Y. (No. 14) 12/	Cents/lb.	21.78	22.10	22.10	22.10	22.10	22.10
Raw sugar loan rate	Cents/lb.	18.00	18.00	18.00	18.00	18.00	18.00
Beet sugar loan rate 13/	Cents/lb.	23.03	23.42	23.42	23.42	23.42	23.42
Grower prices:							
Sugarbeets	Dol./ton	40.78	42.00	42.00	42.00	42.00	42.00
Sugarcane	Dol./ton	29.34	30.50	30.50	30.50	30.50	30.50

NA = Not applicable.

1/ Fiscal year is October 1 through September 30. The 1993 crop corresponds with fiscal 1994, etc. Historic data for area planted, harvested, yield, production, and prices of sugarbeets and sugarcane are on the NASS crop year basis; all other data are on a fiscal year basis. 2/ Beet sugar yield, raw value, per ton of beets (not including sugar from molasses) rises on trend, at 0.1 percentage points each year. Desugaring of molasses adds a net 235,000 tons in 1995, 350,000 tons in 1997, and stays at about 7 percent of beet sugar output through projection period. 3/ Raw cane sugar yield per ton of cane rises 0.06 percentage points per year as new processing technology is adopted. 4/ Quota imports at the low rate of duty, sugar from Canada, and very small amounts of high-duty imports. Projected imports do not necessarily reflect the determination by the Secretary which will be made pursuant to Additional U.S. Note 3 of Chap. 17 of the HTSUS. 5/ For re-export & for polyhydric alcohol. 6/ Exports of domestic sugar which cannot be sold domestically due to allotments. In projections, assumed to be beet sugar. Receives world price. 7/ Includes CCC disposals, refining loss and miscellaneous non-food use, and a statistical adjustment to account for invisible stock change. 8/ Stocks which are available to the market (within allotment levels). 9/ Sugar in excess of maximum allotment, assumed to be marketed in the next year. 10/ Domestic production in excess of allotments. 11/ Includes blocked stocks. 12/ Through 1994, fiscal year average of the nearest futures, No. 14 contract, New York Coffee Sugar & Cocoa Exchange, for 1995 forwards; projected. 13/ Projections from 1995/96.

LOOKING INTO THE CRYSTAL BALL: THE WORLD SWEETENER MARKET OUTLOOK FOR THE NEXT DECADE

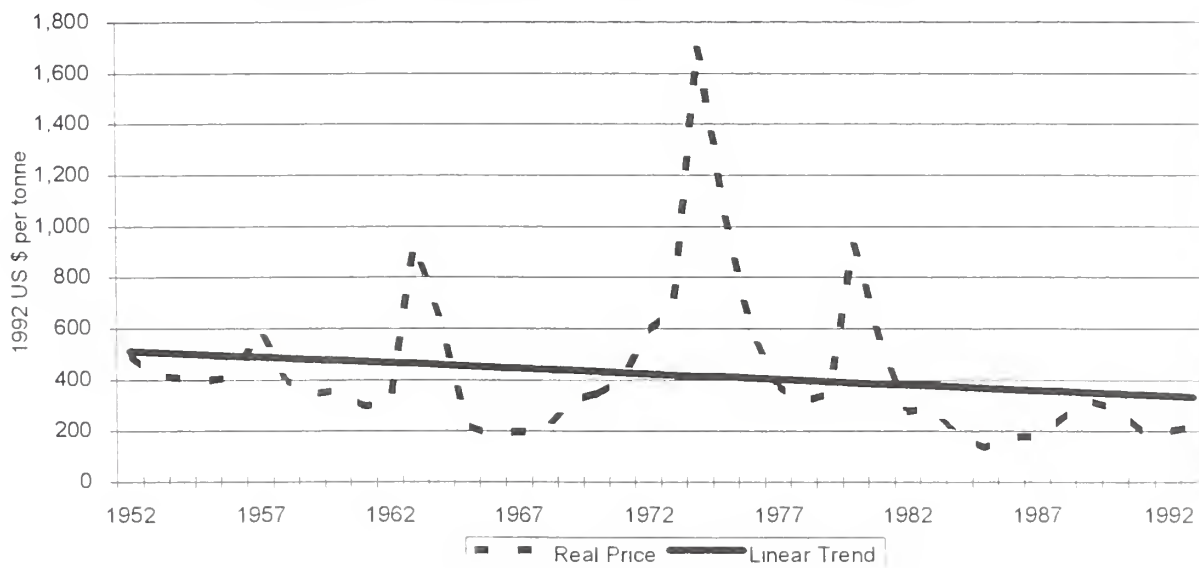
Dr James Fry
Managing Director, Landell Mills Commodities Studies Ltd

Eight minutes do not last very long. Therefore, I will have to cover the outlook for the world sugar and sweetener markets in much the same way as the marvellous US theater company, the Reduced Shakespeare Company, manages to perform an abbreviated version of all the works of Shakespeare within two hours, namely by cutting out all of the complicated or boring bits!

1/. THE TREND IN WORLD SUGAR PRICES

A good starting point is an examination of the long run trend in the world raw sugar prices, to see what this implies for the future — assuming, of course, that the past patterns of behavior remain valid for the next few years, notwithstanding world agricultural trade liberalization. You will see that, when prices are expressed in real terms, with a full allowance for inflation, there is a clear downward trend apparent. Periods of high prices trigger output increases, which result in subsequent periods of low prices, and the latter, in turn, lead to slower output growth and eventually to a return to high prices, bringing the cycle full circle.

Diagram 1: Real Value of World Raw Sugar Price

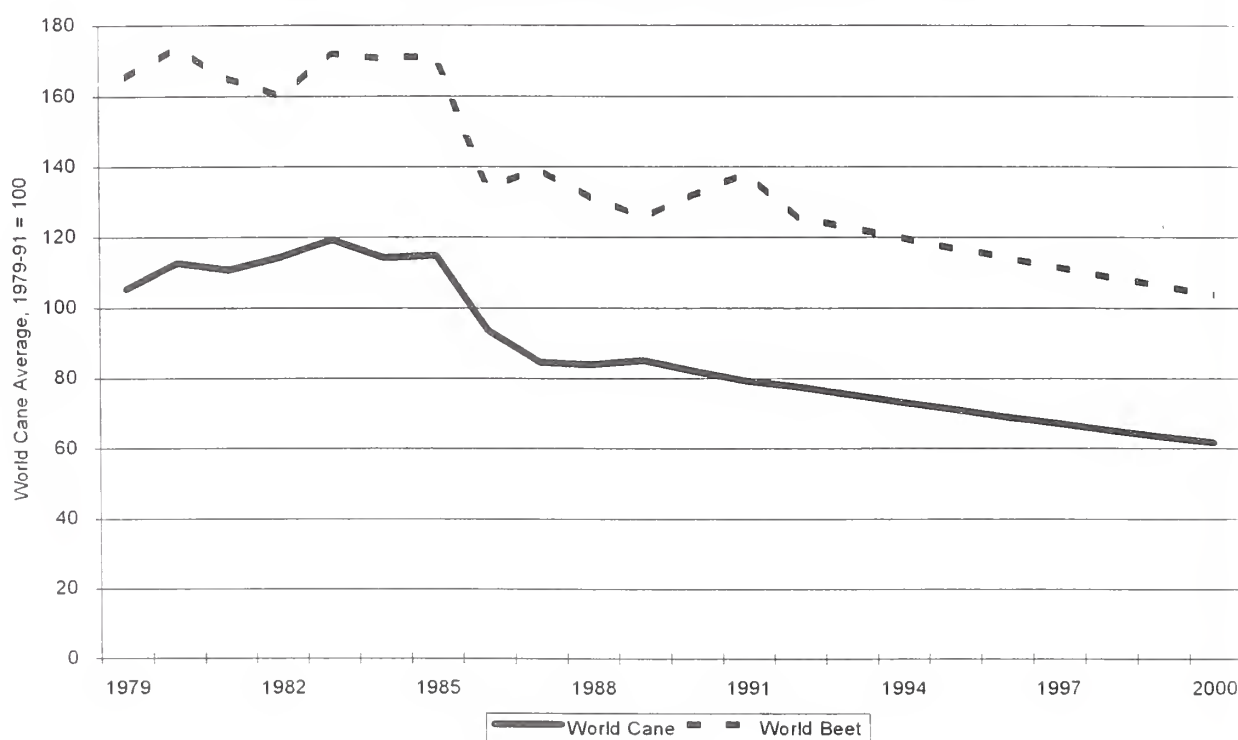


- On the basis of the experience of the past 45 years, the current trend value of world raw prices is in the 13-15 c/lb range. By 2005, it is likely to be down to 11-12 c/lb.

2/. THE COST-COMPETITIVENESS OF SUGAR PRODUCTION

Another vital aspect of the long term trend in the sugar market is what is happening to the cost-competitiveness of different segments of the industry. Sticking to my resolution of cutting out the complicated bits, I have confined myself to a simple comparison of the trends, in index form, of the world cane and beet sugar production costs since 1979, when LMC undertook its first production cost survey. In the next diagram, I have set the average value of world cane sugar production costs between 1979/80 and 1991/92 as the benchmark of 100 for the purposes of comparisons. You will be struck by two main features of the second diagram:

Diagram 2: Total Cane and Beet Sugar Production Costs



- Production costs have tended to fall over time, with the sharpest decline occurring when world prices were at their low point in the mid-1980s, when cost-cutting was most urgently needed by exporters;
- Cane sugar is consistently lower cost than beet sugar.

(Since both cane and beet sugar are expressed in white values, the gap between the two cost curves is not explained by the mere difference between raw and white sugar costs.)

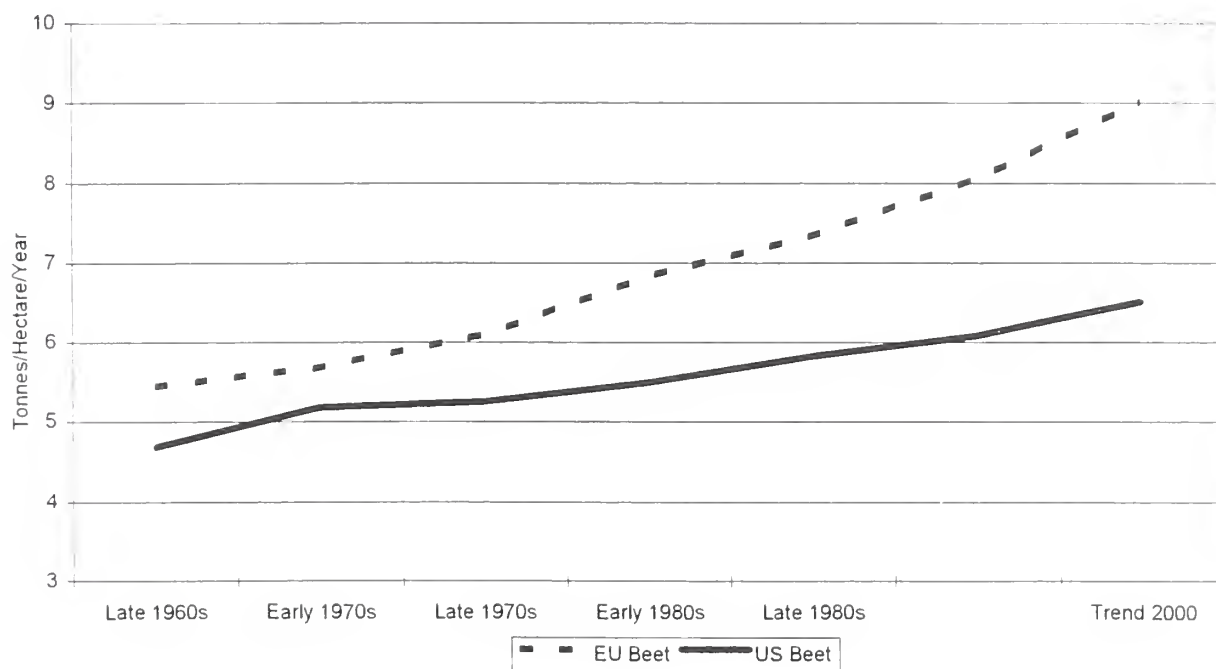
If I had superimposed the world price trend upon the production cost curves, you would have observed a remarkable result: the long run path of the world raw sugar prices is very similar to the long run path of world cane raw sugar production costs.

- This leads me to conclude that, lurking in the background, there really is a fairly free market at work, in which the average raw sugar producer does no more than break even, on average, at world prices.

3/. TECHNICAL EFFICIENCY

On the technical side, the beet industry has been the star performer. The trends in the output of sugar per hectare per year, illustrated in Diagram 3, show the rapid progress achieved by beet growers and processors in the US and in the European Union, the latter maintaining a steady advantage over their US counterparts.

Diagram 3: Recovered Beet Sugar Output/Hectare/Year



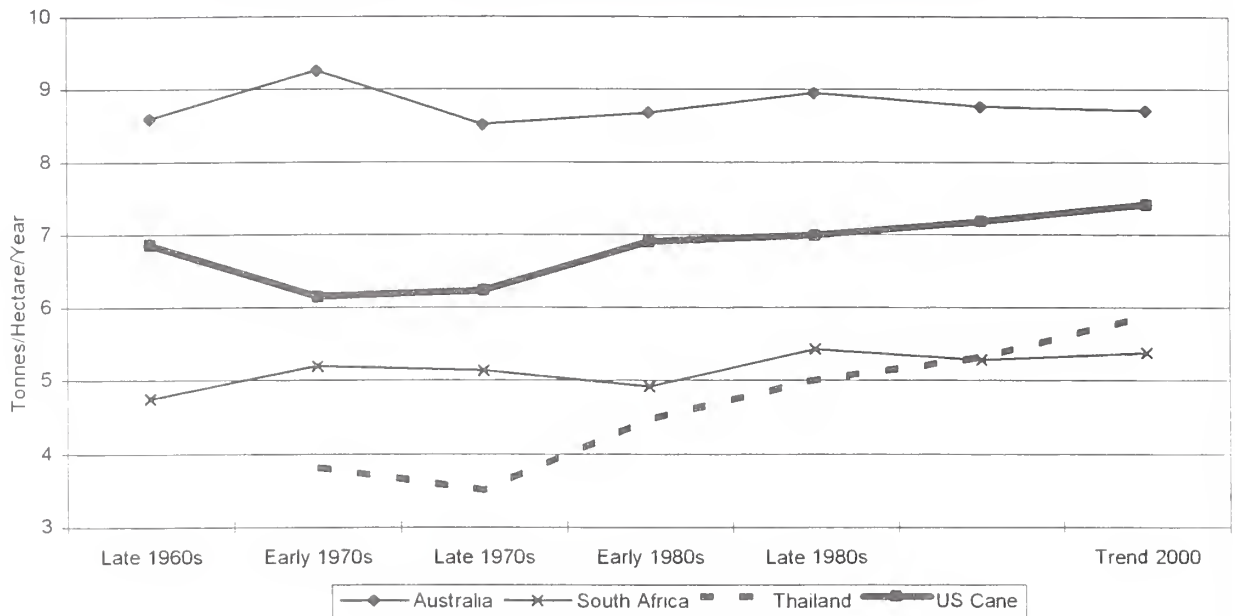
The cane industry, by contrast, has made much slower progress in boosting its yields in most leading countries. Thailand, whose cane sector barely existed at the start of the 1970s, is the sole exception.

4/. DEMAND GROWTH

Having already covered world sugar prices, production costs and yields within four diagrams, let us now turn to what is likely to happen to sugar and sweetener demand. For the sake of

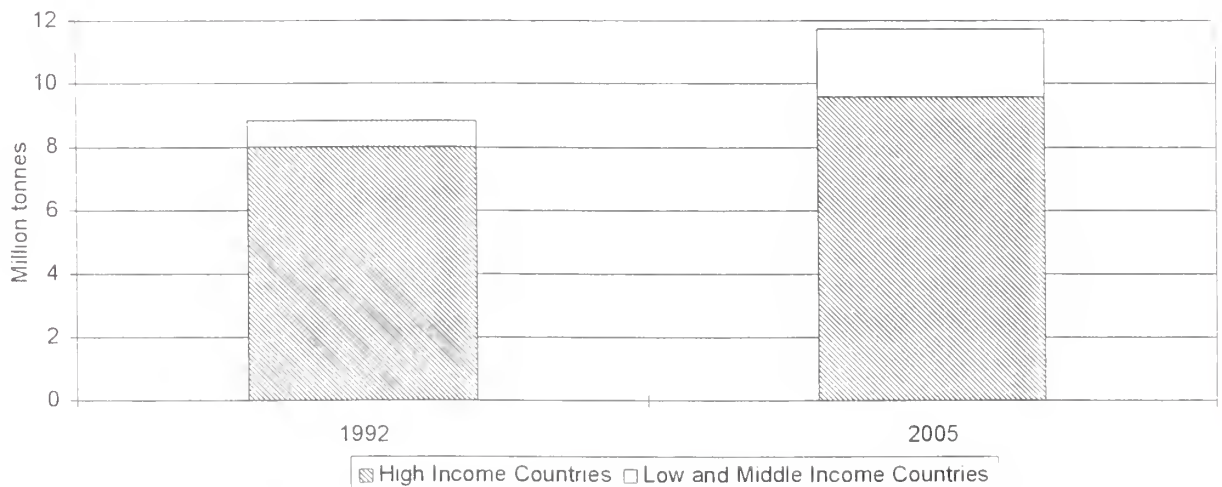
brevity, I will summarize the consumption data in terms of a contrast between high income countries and the developing world.

Diagram 4: Recovered Cane Sugar Output/Hectare/Year



- In both of these regions, we expect HFCS to increase its share of the nutritive sweetener market, but, because HFCS output is so heavily concentrated in high income countries, where sweetener demand is already close to saturation, the share of HFCS in the global market will increase only slightly over the next decade.

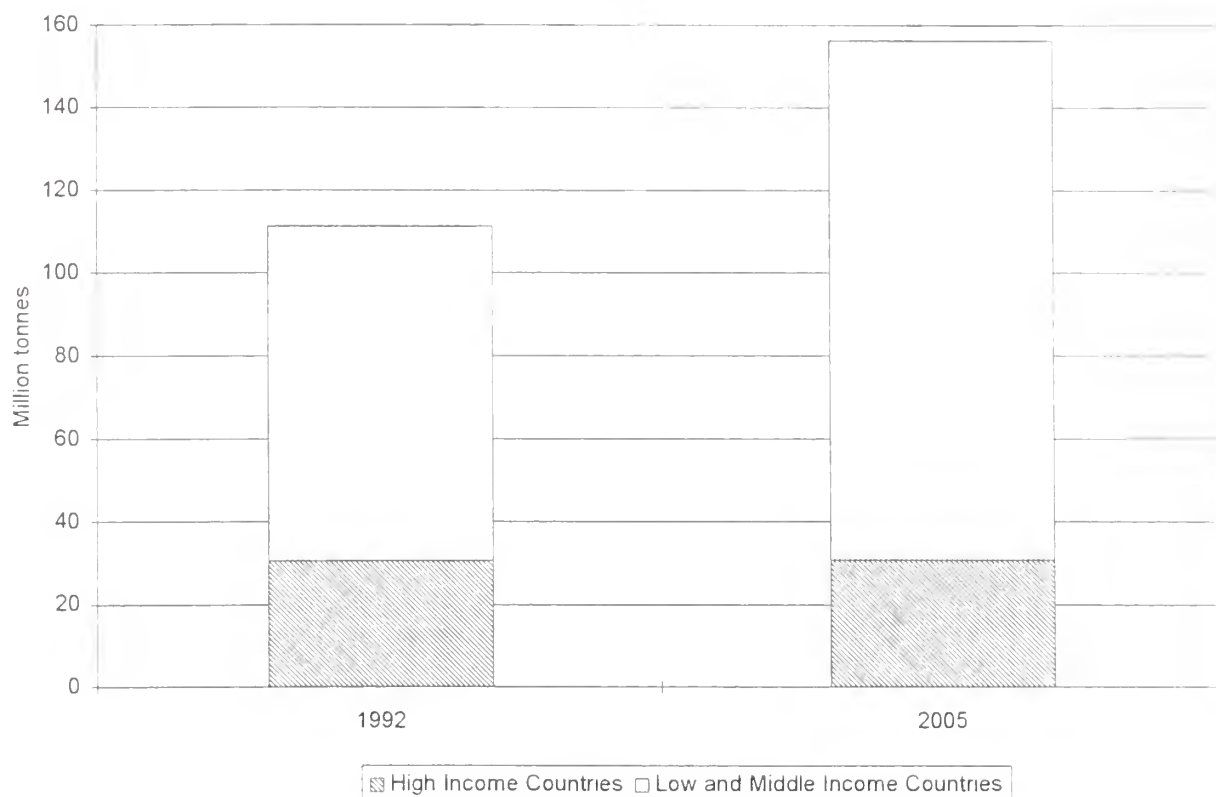
Diagram 5: Regional HFCS Demand, 1992 and 2005



The contrast between the virtual stagnation of sugar consumption in the developed world and the continuing growth in the developing world, led by Asia, is brought out by the next diagram.

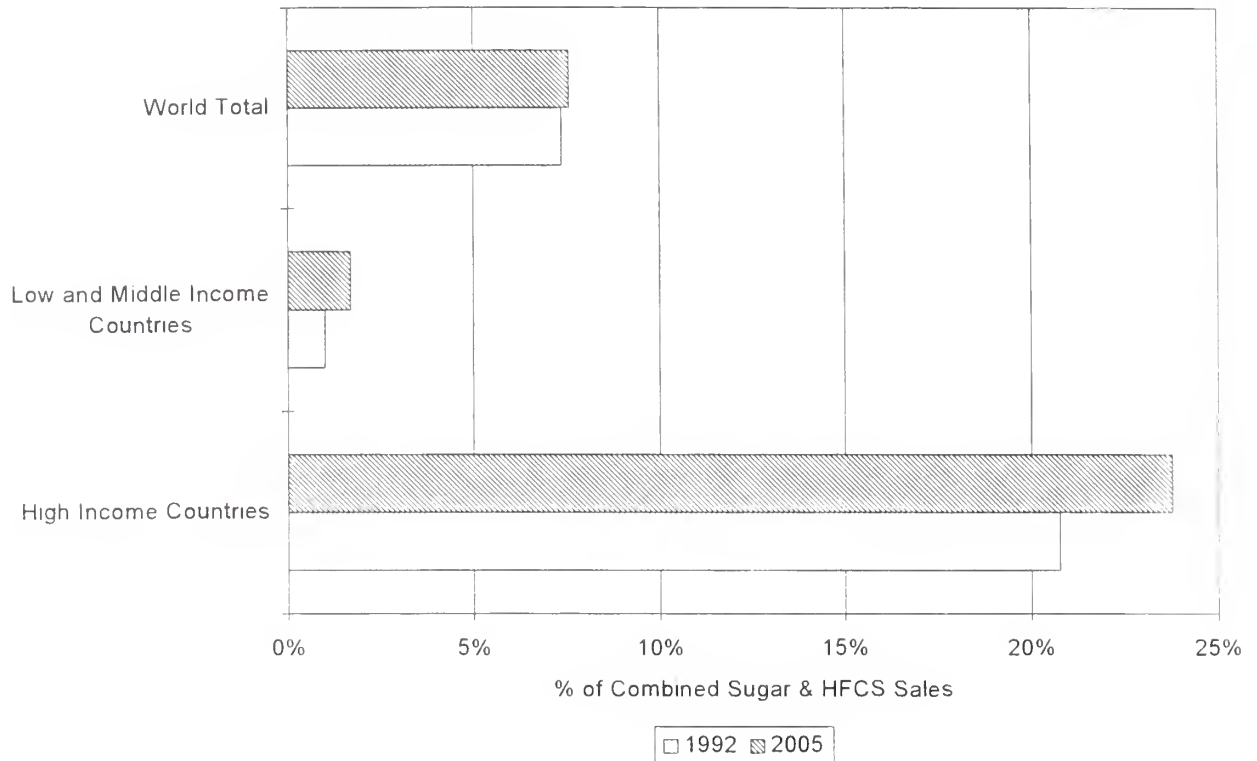
- There is likely to be very little increase in the volumes of sugar used in the First World, but sales to the Third World should grow at over 3% per annum.

Diagram 6: Regional Sugar Demand, 1992 and 2005



- The allocation of demand between high and low income countries, which is heavily weighted towards the latter group in the sugar sector, is reversed in the case of HFCS. Consequently, the very rapid advances predicted in HFCS shipments in the developing world will not have much impact upon the overall share of HFCS in sweetener demand worldwide.

Diagram 7: HFCS Share of Sugar & HFCS Sales



5/. THE PROSPECTS FOR SUGAR TRADE

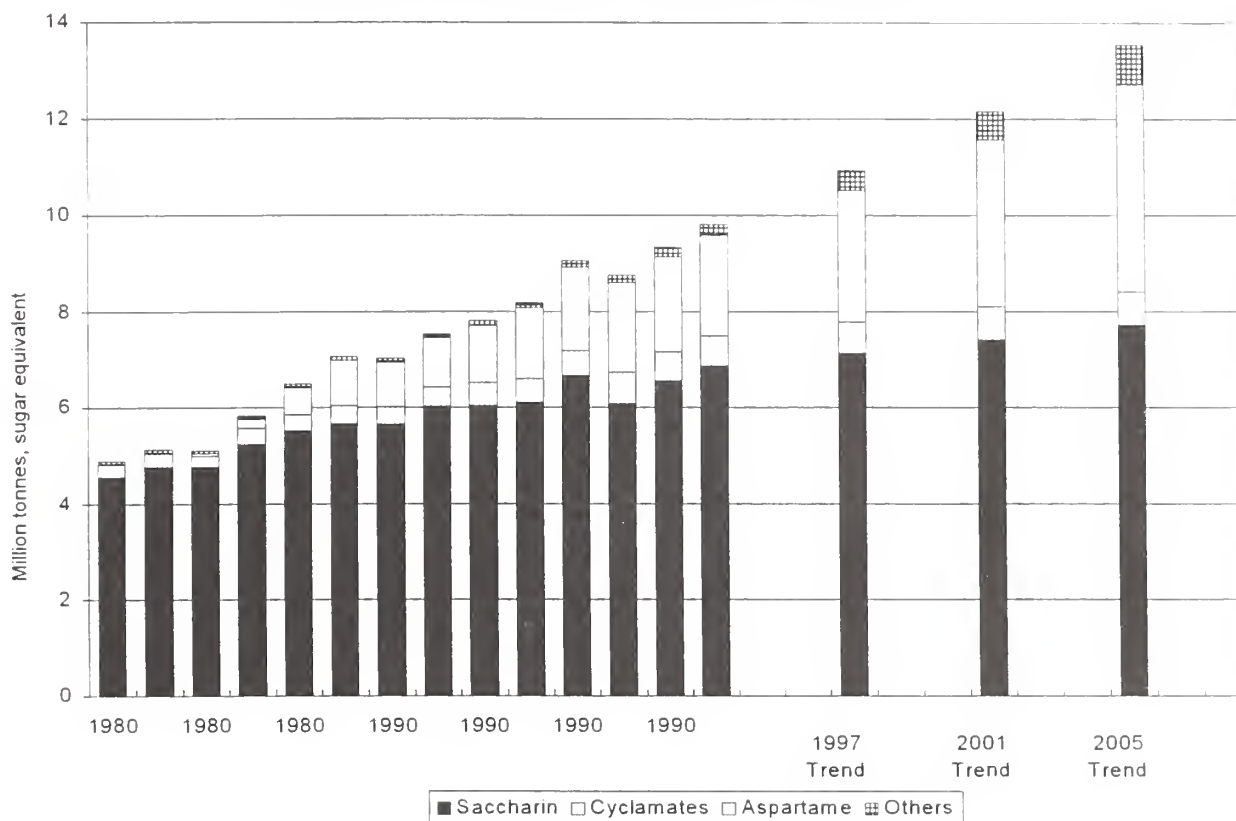
- Within the picture of sugar supply and demand, our own detailed analysis of individual countries and regions reveals that the region which already has the largest export surplus of sugar, namely Latin America, will become an even larger net exporter, in contrast to the situation in both South and Eastern Asia, where recent export surpluses will give way to growing net imports.
- The only other significant shift in trade balances is likely to be that affecting Western Europe, whose output — and, hence, whose exportable surpluses — will decline in the wake of trade liberalization.

6/. INTENSE SWEETENER SALES

The last port of call on our lightning tour of the sweetener industry is to the intense sweetener sector. The final diagram depicts the growth in the sales of the leading intense sweeteners since 1980, together with trend projections until 2005.

- Intense sweeteners can confidently be expected to remain the fastest growing segment of the global sweetener market, with the newer products — aspartame, acesulfame-K, stevioside, sucralose and alitame — accounting for the lion's share of the growth.
- In fact, the rate of expansion in intense sweetener consumption for food and beverage purposes, alone, will be considerably more dramatic than is implied by Diagram 8, since a large part of saccharin demand is destined for non-food uses; but that is another story, and would push me over the limit of eight slides in eight minutes!

Diagram 8: Consumption of Intense Sweeteners



OUTLOOK FOR CORN SWEETENERS 2000

Kyd D. Brenner

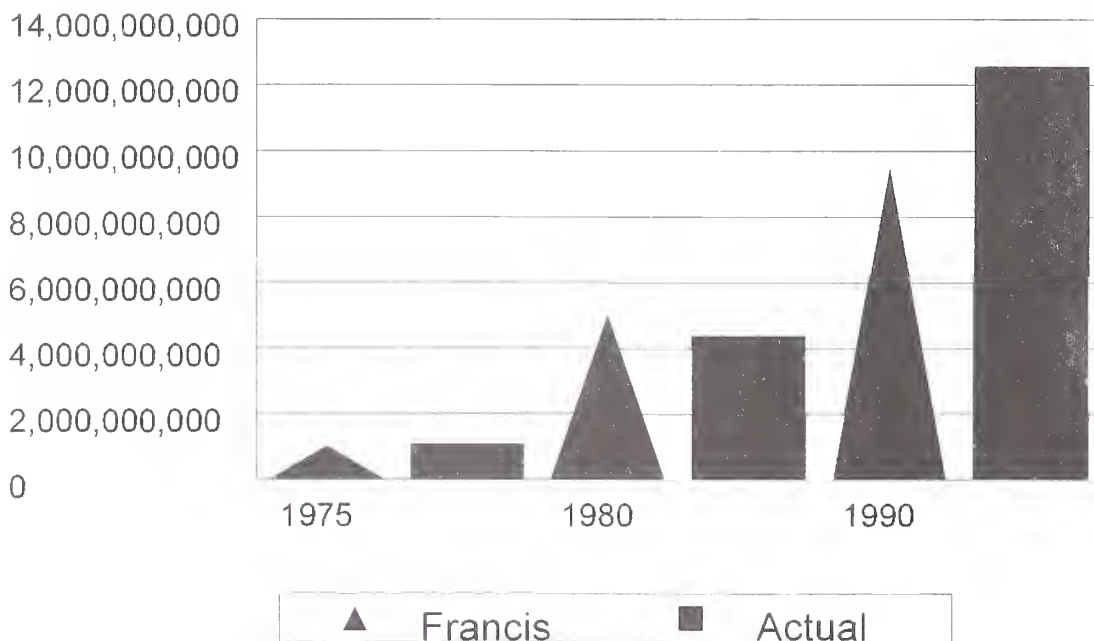
Vice President, Corn Refiners Association, Inc.

Thank you very much for the invitation to be with you today for the new-age agricultural outlook meeting. This year we've all been asked to take off our short-term forecasters' green eyeshades, put on our wizard's hats and do a little crystal ball gazing.

As part of that task I thought it would be useful to take a look back at some Outlook Conference history, for as the Archives building across the river says, What is Past is Prologue.

The first one of these sessions I attended was twenty years ago. At that meeting we heard the first outlook presentation on high fructose corn syrup, given by Don Francis, president of Clinton Corn Processing Company. Don reported there were two producers of HFCS and, spurred by the sugar price spike of late 1974, they expected to produce nearly a billion pounds of HFCS-42 in 1975. To a somewhat disbelieving audience Don predicted that HFCS volume would reach 4 to 6 billion pounds by 1980 and 9 to 10 billion pounds by 1990. Figure 1 shows how Don did. Not too bad considering that hardly anyone knew what we really had at the time. I hope to be able to do as well.

FEARLESS PREDICTIONS - 1975

Pounds Dry Basis

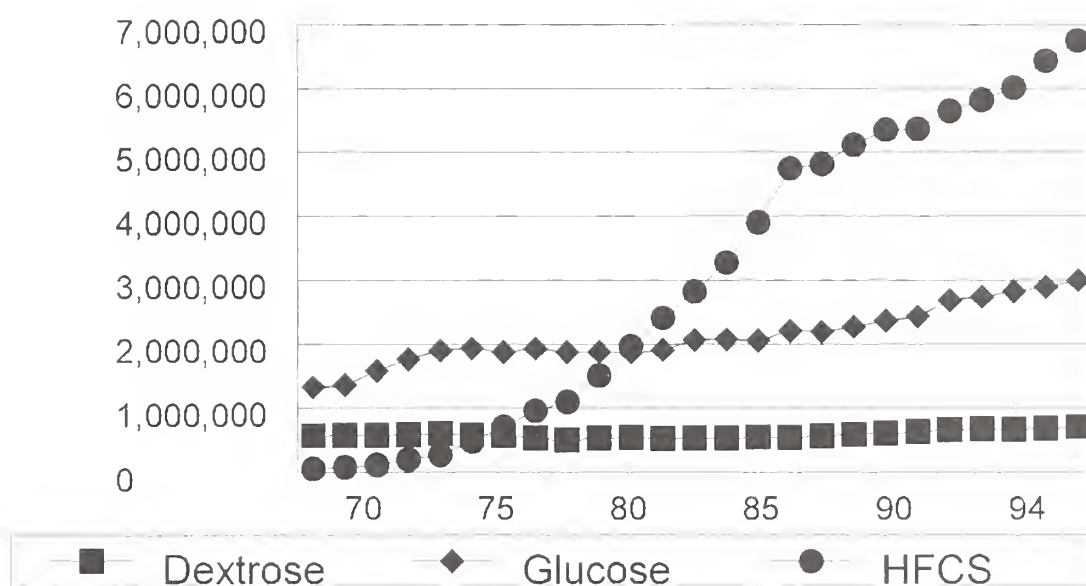
With that bit of history out of the way, what do we see in store for corn sweeteners through the end of the decade?

We start from a recent history of extremely strong growth in both high fructose corn syrup and the more traditional corn sweeteners, glucose syrup and dextrose. A decade ago when the major soft drink bottlers completed their switch from sucrose to HFCS most analysts painted the corn sweetener industry as mature, with growth opportunities primarily from population increases. Indeed many analysts predicted a slow decline beginning in the late 1980s as non-nutritive sweeteners ate away at the beverage market. As we know it didn't turn out that way, and corn sweeteners have been growing at over 4 percent a year since the turn of the decade.

Growth has come in all sectors - not just HFCS, although figure 2 clearly shows the predominant role of HFCS in the corn sweetener picture. Can this kind of strong growth be sustained through the turn of the century? We believe it can and will, although at slightly lower rates.

US CORN SWEETENER PRODUCTION 1970-1994

Metric Tons Dry Basis



Let's take a look at the major factors behind our belief.

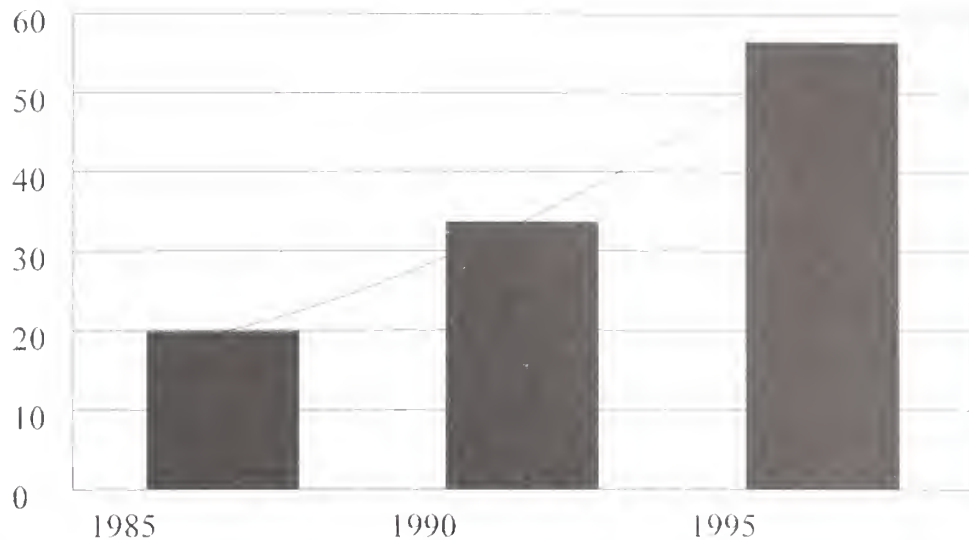
With over 75% of HFCS use in the beverage industry, this is the engine which drives our train. Consumption of soft drinks has shown phenomenal growth in the past several years.

Per capita U.S. soft drink consumption has crossed a major threshold to over 50 gallons annually, up from around 35 gallons in the early-1980s when HFCS was first included in the major beverage formulas. Let's take a look at a couple of the reasons behind this growth:

- Continuing increases in take-away meals and meals eaten away from home. Fountain growth in traditional drinks is strong, with fast food marketers teaming up with beverage companies to provide larger serving sizes. Free refills also encourage consumption.
- The increasing Hispanic population is driving per capita use up as this demographic group has about a 15% higher-than-average soft drink consumption rate.
- American attitudes about sugar and sugar-containing products have taken a dramatic about-face since the 1970s. Sugar is no longer considered a dietary villain. While consumers continue to reduce the percentage of calories from fat in their diets they are replacing those calories with carbohydrates including nutritive sweeteners.
- Increasing concern about tap water supplies has created a new class of consumers who obtain all of their liquids from bottles and cans. This not only helps bottled water consumption, but all packaged drinks.
- Intra-industry competition, between major brands, between the majors and private label companies and between traditional and "new age" beverages has maintained soft drink prices at levels which encourage continued consumption increases.
- The strength of the major beverage companies - through things such as snack food sales in the U.S. and beverage sales overseas has enabled them to focus on maximizing volume in the U.S.
- The U.S. soft drink industry wrote the book on consumer marketing. Now, they are coupling that expertise with a philosophy of maximizing the capacity of their distribution system. There is an increasing willingness to experiment with new beverages which can increase capacity utilization of existing bottling lines and distribution systems. While total sales figures of the major beverage companies do not entirely relate to soft drink volume, and include many other business sectors, figure 3 shows where our major customers have gone in the past decade:

\$ SALES OF MAJOR U.S. BEVERAGE COMPANIES

(Coke, Pepsi, Dr. Pepper, Quaker) - Billion \$



- Finally, on the down side, the soft drink industry is facing a serious challenge in the upcoming year from rapidly increasing packaging costs. Aluminum and corrugated packaging price increases, if reflected in soft drink prices, may have a minor dampening effect on the underlying growth trends discussed above.

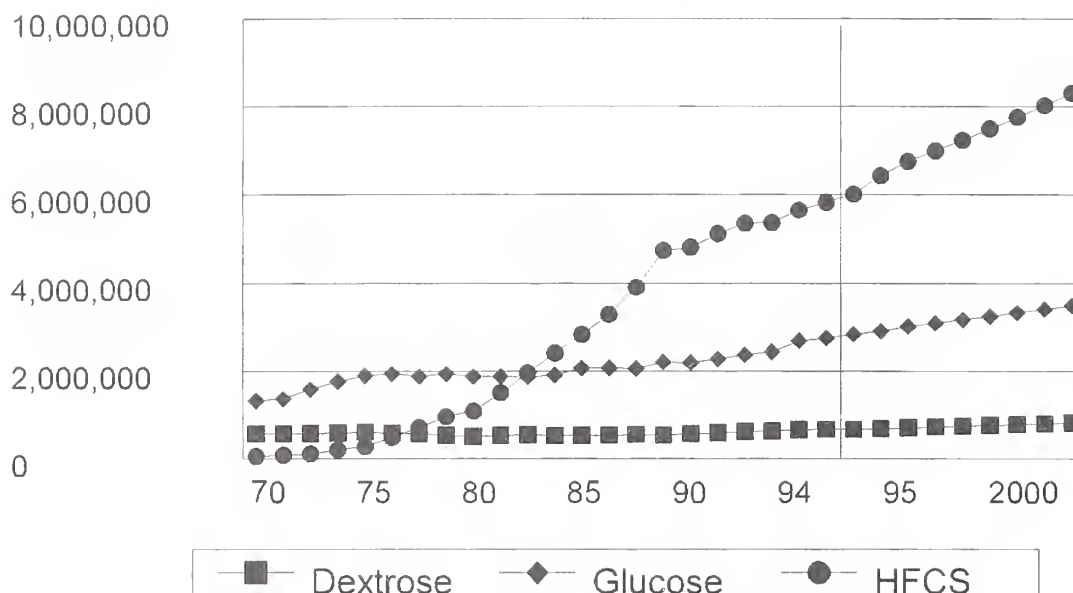
The much-heralded takeover of the beverage business by non-nutritive sweeteners failed to materialize. Several factors appear to have stopped the growth in diet products over the past several years.

- Taste remains a major factor in beverage selection. It seems the number of consumers willing to sacrifice the traditional taste of nutritive sweetened drinks for calorie reduction has peaked - at least for the moment.
- The lack of approval of any new artificial sweeteners in the last several years has prevented the industry from developing new products which often grow rapidly based on an initial marketing push.
- Consumers looking for alternatives to traditional colas have found a ready supply of intriguing products in new age beverages, ready-to-drink teas and fruit-based drinks -- all sweetened with HFCS.

Putting all of these trends together, we believe that HFCS growth will probably be in the area of 3.5% a year through the end of the decade. Figure 4 shows the effect of this trend on U.S. production.

US CORN SWEETENER PRODUCTION - 2000

Metric Tons Dry Basis



While the United States is by far the leading producer and user of corn sweeteners, substantial markets and opportunities exist elsewhere around the globe.

Asia represents the number two region for corn sweeteners use. There the picture is brightened by the rapidly increasing use of HFCS in Taiwan, but dampened by a slowdown in both sugar and corn sweetener use in Japan and South Korea. While HFCS enjoys wide acceptance in these countries, the absolute and incremental levels of sweetened beverage consumption are nowhere near those found in the U.S. Just as the beverage business here pulls corn sweeteners along with it, the slow growth in Japan and South Korea are keeping the train idling in the station.

Looming on the horizon of course is China, potentially the largest expansion market for corn sweeteners anywhere. However, despite all of the potential, corn sweetener expansion in China is hampered by structural and distribution problems which must be overcome if the industry is to be anything but a cottage industry.

The difficulty faced by starch sweetener producers in the European Union is well known. Limited by quota to around 300,000 tons production, the industry is a mere blip on the scale of E.U. sweetener consumption. However, prospects for expansion in non-E.U. nations are bright. Major bottlers are beginning to establish beachheads in Eastern Europe

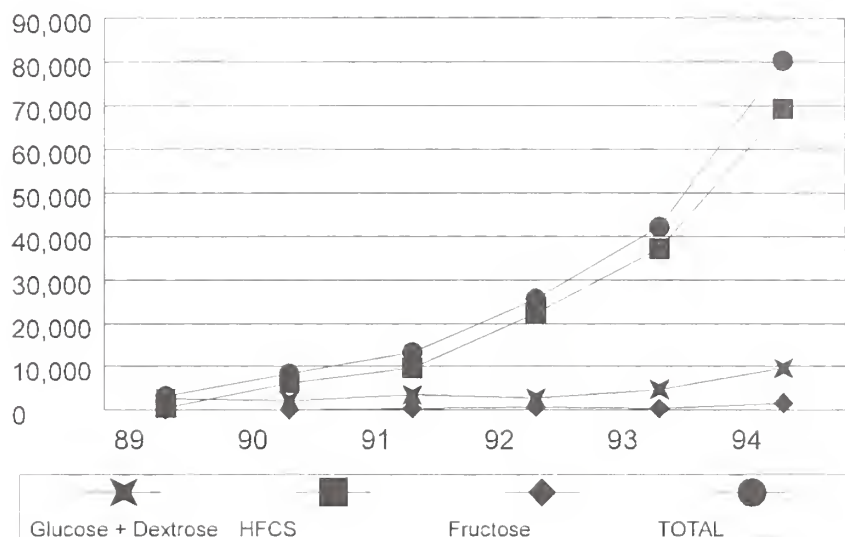
and corn sweetener investment is not far behind. While there still needs to be substantial investment in infrastructure, the beverage companies are reported to be installing the needed liquid sweetener handling systems.

Closer to home a big question has been the future for HFCS in Mexico. As the country with the second highest per-capita consumption of soft drinks in the world Mexico would appear ideal for corn sweetener expansion. However, no aspect of the sweetener outlook has been more rife with confusion, misinformation and rumor over the past couple of years. Let me try and put a couple of things in perspective about the Mexican HFCS situation:

- Corn sweetener shipments to Mexico have been expanding rapidly. However, as a percentage either of U.S. production or Mexican sweetener consumption they are still quite small. Figure 5 shows the recent history.

US CORN SWEETENER EXPORTS TO MEXICO

Metric Tons - Dry Basis



- Full conversion of the Mexican soft drink industry to HFCS will require in the neighborhood of 2 million tons of product. In the foreseeable future - between now and the year 2000 - probably no more than half of this market will materialize.
- In the "long-run" (that period of time defined by economists as when most of us will be dead) the Mexican soft drink industry will be dominated by HFCS. The underlying factors of raw material economics, processing technology and product quality are too strong to be stopped.

Corn sweetener growth in Mexico is going to be a mix of U.S. exports and domestic production. Logistics dictate that it will be more economical for U.S. producers to supply the northern tier of states, while domestic plants will be in a better position to supply the more populous south. You have probably noticed over the past several months expansion announcements by several U.S. wet millers. In some cases these have explicitly referenced the potential for increased exports to Mexico. At the same time there have been other announcements of joint-venture projects in Mexico. Together these announcements suggest that the mix will be around 50-50 between domestic HFCS production and imports from the U.S.

There has been much discussion about two factors which could influence the rate and degree of HFCS penetration in Mexico: the impact of the peso devaluation and the impact of a private boycott of HFCS being pushed by some parts of the Mexican sugar industry.

There is no question the recent crash of the peso will have a short-term effect on the switch to HFCS, especially in the border markets dependent on U.S. supplies. Even with the efficiency of the corn refiners, it's hard to take an external 30-50% price increase and stay competitive. However, the industry intends to do all it can to remain in this market. Whether the peso situation will take six months or two years to resolve remains to be seen. Already we have seen improvement from the crash of December and the U.S. actions to restore confidence are having some effect.

The so-called HFCS boycott is another issue which we do not believe will have any appreciable effect on the long-term future for corn sweeteners in Mexico. While they remain small, HFCS exports to Mexico have doubled during the period the boycott has been in effect. Potential users who may consider avoiding HFCS for political reasons will not stay on the sidelines long as they see their neighbors and competitors reaping the financial advantages available from HFCS use.

Finally I would like to take a short look at the non-HFCS side of the corn sweetener business. Last year the U.S. industry produced around 3.7 million tons of glucose and dextrose sweeteners. Like HFCS, the resiliency of these products over the past several years has surprised many observers. Since 1990 we have seen a 2 percent growth rate nearly double.

There are a couple of major factors behind this growth.

- Market growth in these sectors has traditionally been tied closely to overall economic growth. In large measure, the market increases represent a reflection of the general economic picture.
- The previously mentioned trend to substitute calories from fat for calories from carbohydrates benefits all sweeteners, but is particularly good for lower-

cost corn sweeteners. The confectionery and baking markets are both areas which have seen growth above food industry averages and which are large users of traditional corn sweeteners.

Looking out at the next few years we would expect growth in the traditional corn sweeteners to slow down a bit, probably falling back to around the 2.5% level.

Lastly, you will notice I have not devoted much time to crystalline fructose - despite the fact that this is an excellent corn based sweetener for a variety of specialty applications. The current sugar legislation limits domestic markets for crystalline fructose to around 150,000 tons, and until this limit is removed major users have little incentive to develop new products based on crystalline fructose.

One final trend to keep an eye on is the continuing growth in dextrose use for industrial products. Today corn refiners have branched out into a number of new dextrose-based products such as feed additives and organic acids. For example, in Europe environmental legislation is pushing detergent manufacturers to use dextrose-based materials and similar trends in this country could provide a valuable new dextrose market. Dextrose is also behind one of the newer corn-based degradable plastics and is the base for feed additives and antibiotics such products as lysine, tryptophane and bacitracin.

Again I appreciate the chance to visit with you today and look forward to participating in the discussion period.

AGRICULTURE : A NEW BEGINNING

Dr Don Russell
Ambassador of Australia

Introduction

It is a great pleasure to be here today at this Agricultural Outlook Forum organised by the Department of Agriculture.

For those of you who have some understanding of Australian agriculture and the debate back home in Australia, it might seem a little unusual to have the Australian Ambassador as your guest speaker.

Some might even be a trifle apprehensive about what I might say.

An Australian with a microphone and an audience of American grain producers is a potentially heady combination.

But let me assure you I come with a positive message.

It is a message based on the difficult choices and hard decisions that we have made back home in Australia over the past decade.

And it is a message that is very relevant to American agriculture as you too are having to face up to a changing world.

As I am sure you are all aware, a day does not go by in this country without someone questioning the value of US farm policies.

Whether it is the President's Council of Economic Advisers pointing out that today's agricultural support programs are rooted in the New Deal of the 1930s when farm households accounted for 25 percent of the US population and generated over 10 percent of GDP, whereas the figures today are 2 percent of the population and 2 percent of GDP.

Or Senator Lugar calling for sharp cutbacks in farm subsidies of almost \$15 billion over five years.

Or House Majority Leader Dick Armey calling for the end to the staggering waste and inefficiency that afflicts US farming in his article "Moscow on the Mississippi".

Or the farmers themselves complaining of the burden of federal regulation and the restrictive requirements associated with participation in the price support programs. Indeed, farmers appear increasingly to be questioning whether it is even worth participating in the commodity programs and more farmers are being attracted to rural industries which are not supported by the government.

The relentless message is that something is wrong.

And when people look at the programs in more detail the problems compound.

Take the sugar industry for example.

With the recent imposition of marketing allotments, the US sugar industry is now almost completely insulated from domestic and international competition.

How can this possibly be to the long-term benefit of the industry or the consumer? Frankly, it seems little more than a government managed cartel.

With a GATT bound import quota in place, one might ask why a domestic program is needed at all? Why not abolish the domestic program? This would promote domestic competition and efficiency as a significant first step toward the eventual liberalisation of the US sugar market.

Sugar in the U.S. is twice as expensive as in Australia which grossly distorts the sweetener market here in America often in surprising ways.

For example, soft drink manufacturers in Australia sweeten their product with cane sugar as soft drink manufacturers do the world over if they are allowed to purchase sugar at competitive prices.

They do it because, all things being equal, cane sugar tastes better.

Here in the United States, soft drink manufacturers sweeten their products with high fructose corn syrup because it is too expensive to do otherwise.

All of this means that because of a small number of cane growers in four States, all American consumers are forced to drink soft drinks sweetened with corn syrup. In fact the GAO has estimated that 17 cane farms receive 58 percent of the estimated cane grower benefits.

I might mention that one unexpected pleasure facing Americans travelling to Australia is that for the first time they will have the opportunity to taste Coca Cola as it was meant to taste.

A second example is the dairy industry.

For the first time dairy export subsidies have recently been extended to a number of Asian markets where Australia has a major presence. The initial bonus for non-fat dried milk powder

was some \$US100 a tonne greater than was needed to make a sale. This is not in the long run interest of US exporters.

Western US dairy producers are highly efficient and they are in a position to gain a permanent presence in Asia in their own right. However, US export subsidies only serve to depress the price in Asian markets thereby hindering efforts by US industry to build good long run markets.

The more you subsidise, the more you depress the price, the more you have to subsidise.

Much US regulation of the dairy industry is designed to protect inefficient US producers against world class US producers. The subsidies just get built into land values making efficient US producers less efficient. Higher land prices also burden other non-subsidised rural industries in America.

It needs to be remembered that for many rural industries, it is the cost of land which is the major cost of production.

Let me be clear, Australia welcomes competition because it is competition that keeps our industries strong.

The irony of this episode is that, in the name of creating market recognition for US producers in Asia, it was European traders who took advantage of the extension of the export subsidies and who pocketed US taxpayers money. Asian consumers would not have even been aware that they were buying US product.

Of course I could not speak today without mentioning export subsidies for wheat and the infamous Export Enhancement Program (EEP).

I simply have to express my amazement at the recent EEP announcement for Cyprus where a bonus level of around \$2 per tonne was used to sell 20,000 tonnes of wheat. Surely, industry could have made do without a \$2 bonus especially as the cost of the paperwork would have outweighed the bonus several times over.

When industry takes a \$2 a tonne subsidy, there can be no other explanation than that they have become addicted to government support.

And in a very real way, that \$2 subsidy says everything about why government supported agriculture is so wrong.

It creates a mentality of dependence.

It saps an industry's confidence in itself and it builds the belief that without a government hand-out the industry could not export and survive.

The industry becomes so obsessed with its support programs that it loses sight of the product it is selling.

It loses sight of the customers.

It loses sight of the need to innovate, to reduce costs and build markets.

When you see an industry's leaders spending most of their time in the corridors of power rather than out developing and selling product then you know you really are in trouble.

Government support rewards inadequacy, it rewards failure.

It tells an industry that it can not make it on its own without the hand of government.

But the dreadful truth is that the very same hand that gives support will in the end strangle the life out of even the most proud of industries.

The sad thing is that I am sure there is nothing fundamentally wrong with American agriculture. Australia and the United States have a common, proud tradition of successful family farms building a nation.

We both have a lot of land and, compared to ours, your land is not only plentiful but highly productive.

You have an enormous domestic market and a long history of large-scale production. I can see no reason why US agriculture cannot be as efficient as Australian agriculture.

If US agriculture is inefficient it can only be because government has made it that way.

The only solution that I can see is to let American agriculture breathe again and to break the sorry chain of welfare dependency.

Let American farmers make decisions about what they grow.

Take away the subsidies and the support prices.

Let American farmers do what they do best.

All of this might sound like "tough love" and many might fear that without government support US farm production would fall sharply.

But I am sure that this would not happen as the recent Australian experience so powerfully illustrates.

As is the case here, Australian Governments got into the business of providing support to Australian industry for well intentioned reasons.

But as you are finding out here, we discovered a long time ago that most of that support was misdirected.

Farmers simply ended up focussing their decision-making energies on maintaining existing support measures, rather than positioning themselves to take advantage of future market opportunities.

In Australia we were faced with a basic choice:

- . Either we continued to insulate our farmers and our other industries from market realities, and accepted spiraling budgetary costs and dismal economic performance.
- . Or we consciously took steps to open up our economy and make our industries competitive and our exporters world class.
- . In reality, there was no choice.

Although it took some time and much leadership from industry and others to build the necessary support the Australian people are now pleased that they took the hard decision.

There is a new found pride and optimism amongst Australian farmers that, frankly, I find quite uplifting.

You now appear to be at the same point in your internal debate as we were a number of years ago. The real question is how to manage the transition away from government assistance while developing a competitive and growing agricultural sector. These goals might appear contradictory, but they are not. The most effective way of building a successful agricultural industry with expanding exports is to take away the subsidies and strip away the domestic support programs.

Let me provide you with some examples.

Wheat

Through a strong Australian government-industry cooperative effort, significant changes in the wheat industry have been made over the last five years to foster a more market driven culture and reduce government involvement in the industry. 1989 was a turning point, with deregulation of the domestic market, repeal of the home consumption wheat price and removal of the guaranteed minimum price for wheat.

OECD figures for 1993 indicate Producer Subsidy Equivalent (PSE) for wheat was 5% in Australia compared to 51% in the United States. Despite the low level of assistance, output continues to expand.

Dairy

In the mid-1980's the Government took the decision to grant New Zealand access to the Australian dairy market in the context of the free trade agreement with New Zealand. Conventional wisdom held that the Australian dairy industry would be devastated when exposed to the most competitive dairy producer in the world, New Zealand. Since 1985-86, Federal Government assistance to the industry has declined by over 65% while, over the past ten years, milk production has increased by one third and the volume of exports has more than doubled.

The Australian dairy industry has developed into a prosperous export industry and, consistent with our Uruguay Round commitments, supports will continue to decrease until the year 2000.

I am sure that the New Zealanders expected that the dairy market in Australia would be easy pickings for them and they certainly did not expect to have to face a revitalised Australian dairy industry in export markets when we dismantled protection in Australia. There may well be lessons here for US negotiations with Canada on access questions.

Sugar

For most of this century the Australian sugar industry has been tightly regulated under state and federal legislation. Regulations controlled the land on which cane could be grown, specified the mill to which the cane must be delivered, and provided the framework for determining the distribution of revenue between growers and millers. Compulsory acquisition powers centralized control of raw sugar marketing. Other legislation set in place an embargo on imports and determined domestic pricing.

In the early 1990's a series of reviews resulted in significant deregulation of the industry. In response, Australian sugar production has expanded rapidly and we expect to be the world's largest exporter in 1995. Approximately 80% of our sugar crop is for export. The liberalisation process is expected to continue with a further review of sugar policy to commence this year, with new legislation to be in place by July 1, 1996.

The point here is that the single best stimulant for promoting a prosperous farming sector is competition - international competition. Government policy must promote international best practice and that is not brought about by subsidies - domestic or export.

Certainly, the transition can be painful as industry re-structures and it is here where government can best help.

But government is doing no one any favours by trapping large numbers of families in low income marginal agricultural industries propped up by inefficient and, in the end, debilitating government support programs.

One program developed by the Australian Government which has worked well is the Rural Adjustment Scheme which aims to facilitate better farm management and sustainable productivity growth on farms. The Scheme provides assistance to farmers who can show that it will lead to sustainable improvements in productivity and profitability without further government assistance.

Support is available in the form of:

- . interest rate subsidies of up to 50 percent on commercial finance for productivity improvement measures
- . grants for training to upgrade farm business and property management skills
- . and, grants to assist with the cost of obtaining expert financial and planning advice relating to farm business.

All of this might sound a little self-serving and be prompted by the fact that Australia is an efficient agriculture producer locked out of the US market by protectionist barriers and forced to compete with subsidised US product on world markets.

The fact that we have an enormous trade deficit with the US, which is bigger per capita than the US deficit with Japan, might also be seen as colouring our thinking.

Our producers also operate in the knowledge that we have better access to Japan for agriculture than we do with the US.

All of this is reflected in the debate back home, but it does not change my basic point that the US is potentially a world class agricultural producer held back by the very government support programs designed to give US producers an edge.

And it is wrong to think that world agricultural markets will always be hopelessly corrupted and that the non-subsidisers will always be prey to the subsidisers.

In fact the medium term outlook for world trade in agricultural products has improved quite dramatically because of the Uruguay Round which provides all efficient agricultural producers and potentially efficient producers like the US with a rare opportunity.

Some have mistakenly argued that the Uruguay Round has legitimised export subsidies for example and are looking forward to joining the bad guys with cheerful abandon.

This misses the point.

What the international community has decided is that:

- . it is no longer prepared to tolerate increasing levels of trade disruptive forms of domestic support
- . countries which do support agricultural production have an obligation to provide guaranteed minimum levels of access to their domestic markets
- . subsidised exports are among the most disruptive forms of behavior and consequently are likely to be the most strongly disciplined in future.

It is therefore not a question of whether, but by how much, existing disciplines will be tightened next time around, with consideration of agricultural negotiations scheduled to recommence in 1999 (if not before).

In addition, the NAFTA, the proposed Free Trade Area of the Americas, and the Asia Pacific Economic Cooperation forum (APEC) all have agriculture liberalisation as part of their respective agendas.

The Europeans are already embarked upon (indeed, have had forced upon them internally) a series of farm sector adjustments that could take them beyond their current Uruguay Round obligations and with EU expansion there will be constant pressure to rein in agricultural subsidies.

There is great scope for the US to continue to put pressure on the Europeans to further scale back subsidies in exchange for cuts in US programs.

This is not unilateral disarmament.

This is continued US leadership on an issue which is very much in the interests of US agriculture.

You can be assured that Australia and our colleagues in the Cairns Group of agricultural fair traders will be there fighting alongside you.

And as the subsidies come down world demand for agricultural products should be steadily expanding as China and East Asia continue to grow strongly.

The message I bring to you today, therefore, is a bright one.

The outlook is good, the momentum is there in this country for change.

For most of history Americans have proudly boasted their free trade credentials. And rightly so.

The best thing that we can all do for the farmers of Australia and the United States is to let them compete and let markets work.

Let us show faith in the qualities of hard work and personal resilience.

These virtues have served both our countries well in the past and I am sure they are the keys to our future.

Thank you for the opportunity to talk to you today.



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**STRUCTURAL SHIFTS
IN
LIVESTOCK PRODUCTION
A PERSPECTIVE ON THE ISSUES**

**Agricultural Outlook Forum
United States Department of Agriculture
Washington, D.C.
February 23, 1995**

John S. Nalivka

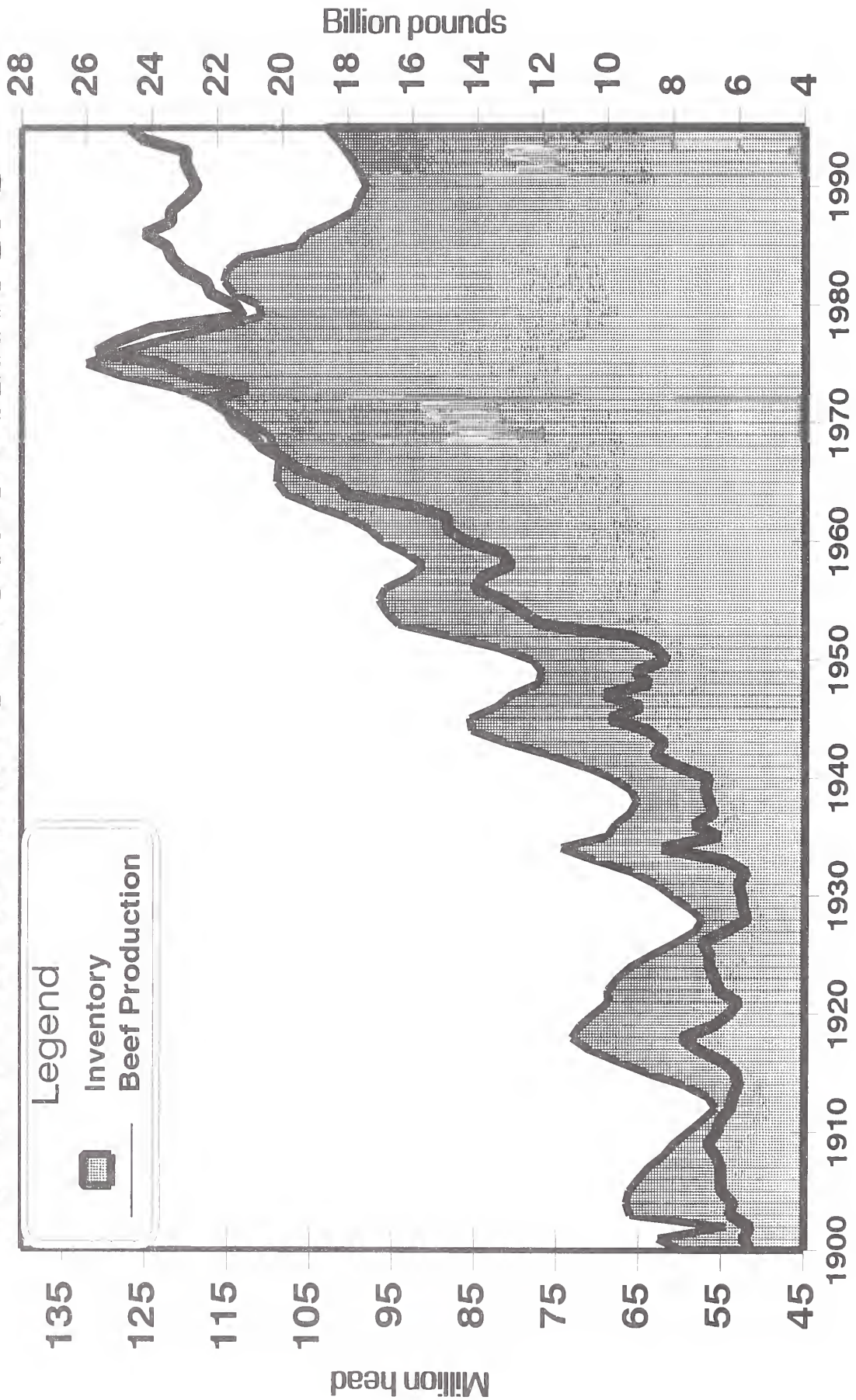
Catalysts to Regional Shifts in Livestock Production

- ✓ Land Base
 - ▶ Feed quantity & quality
- ✓ Water
- ✓ Capacity Issues
- ✓ Costs of Production

Catalysts to Regional Shifts in Livestock Production

- ✓ Custom & Culture
- ✓ Legislative & Regulatory
- ✓ Capital

Beef Production & Cattle Numbers

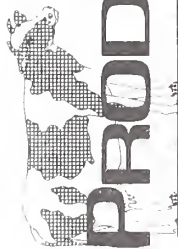


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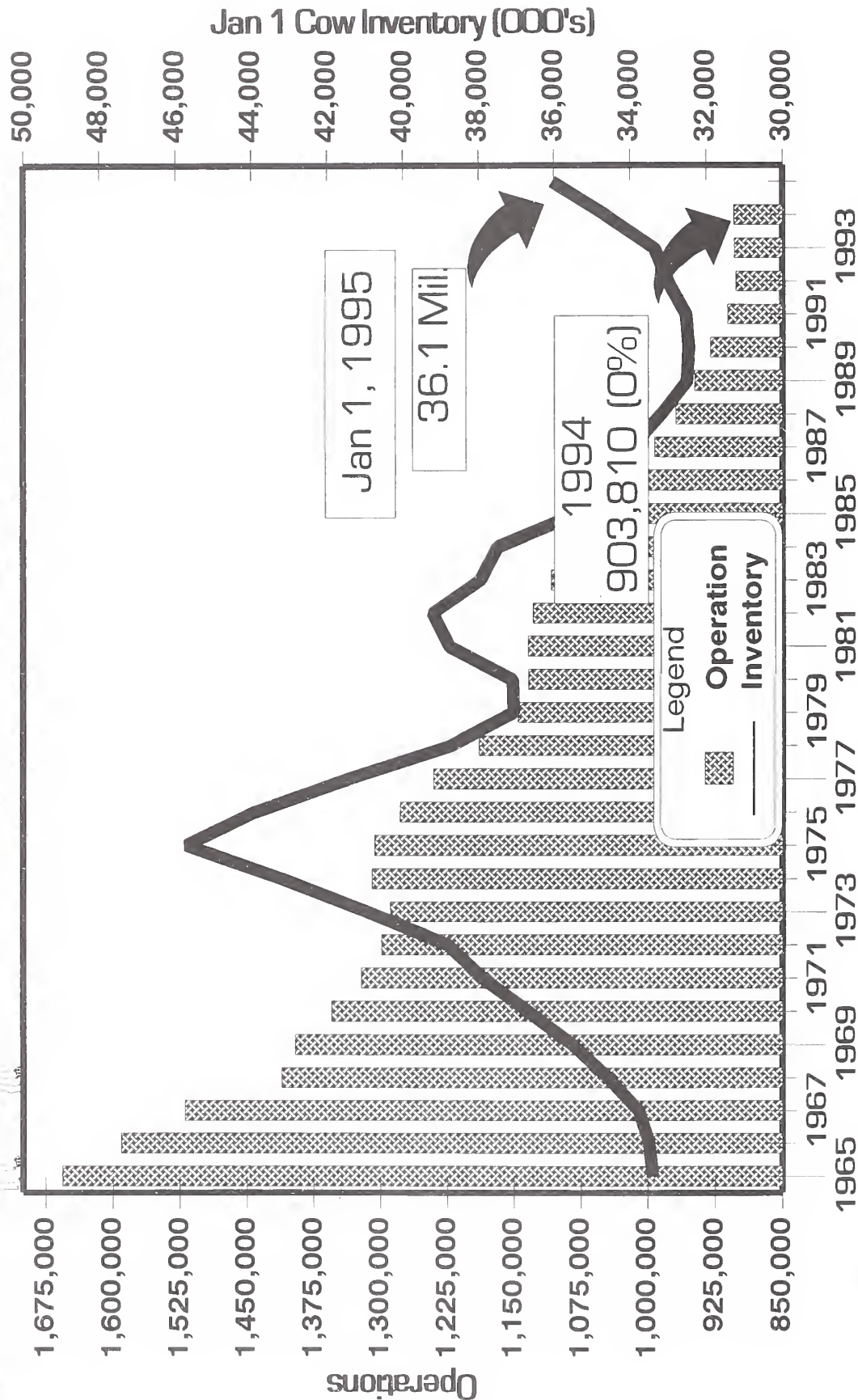
Beef Production & Cattle Numbers



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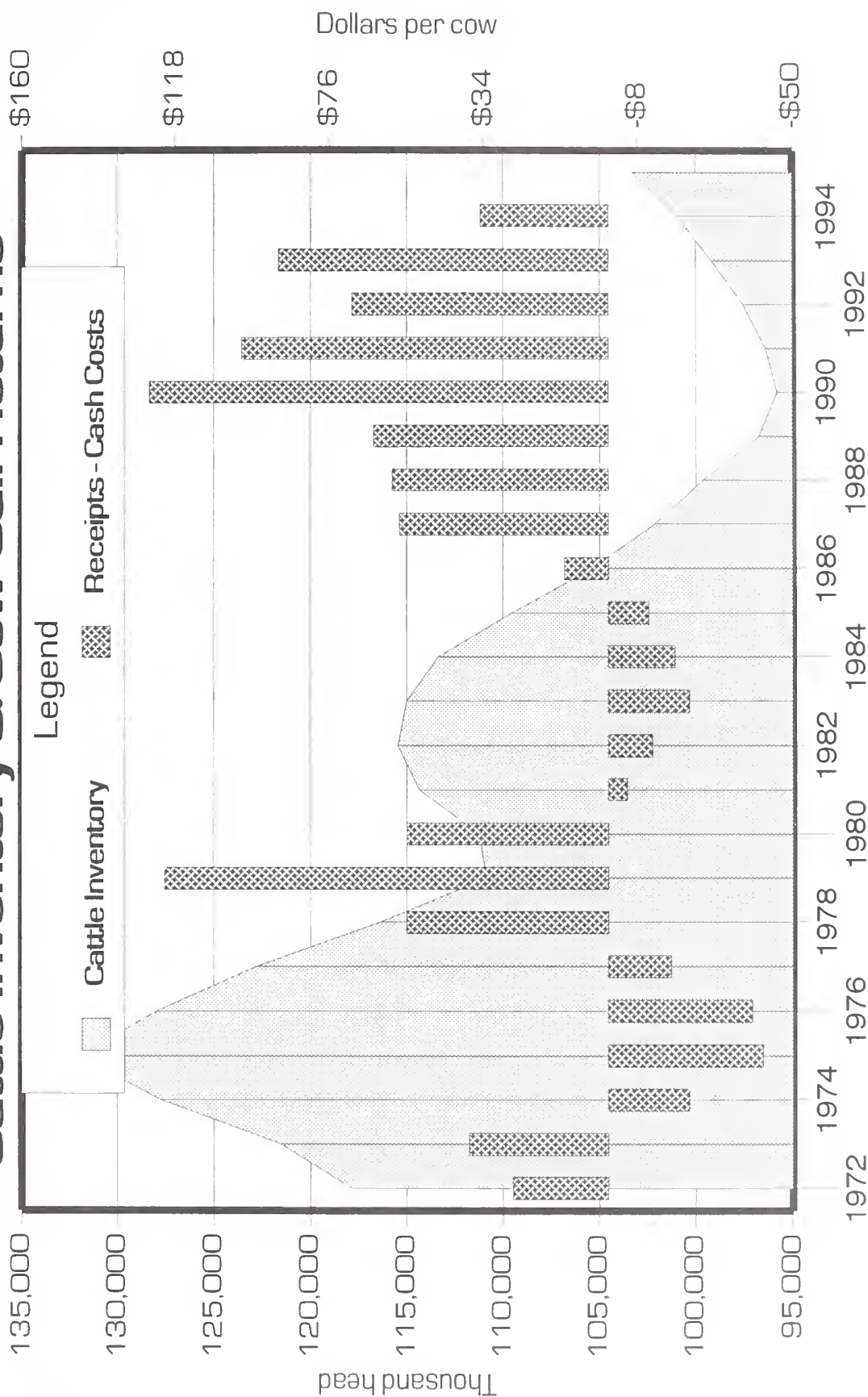


BEEF PRODUCER CONSOLIDATION



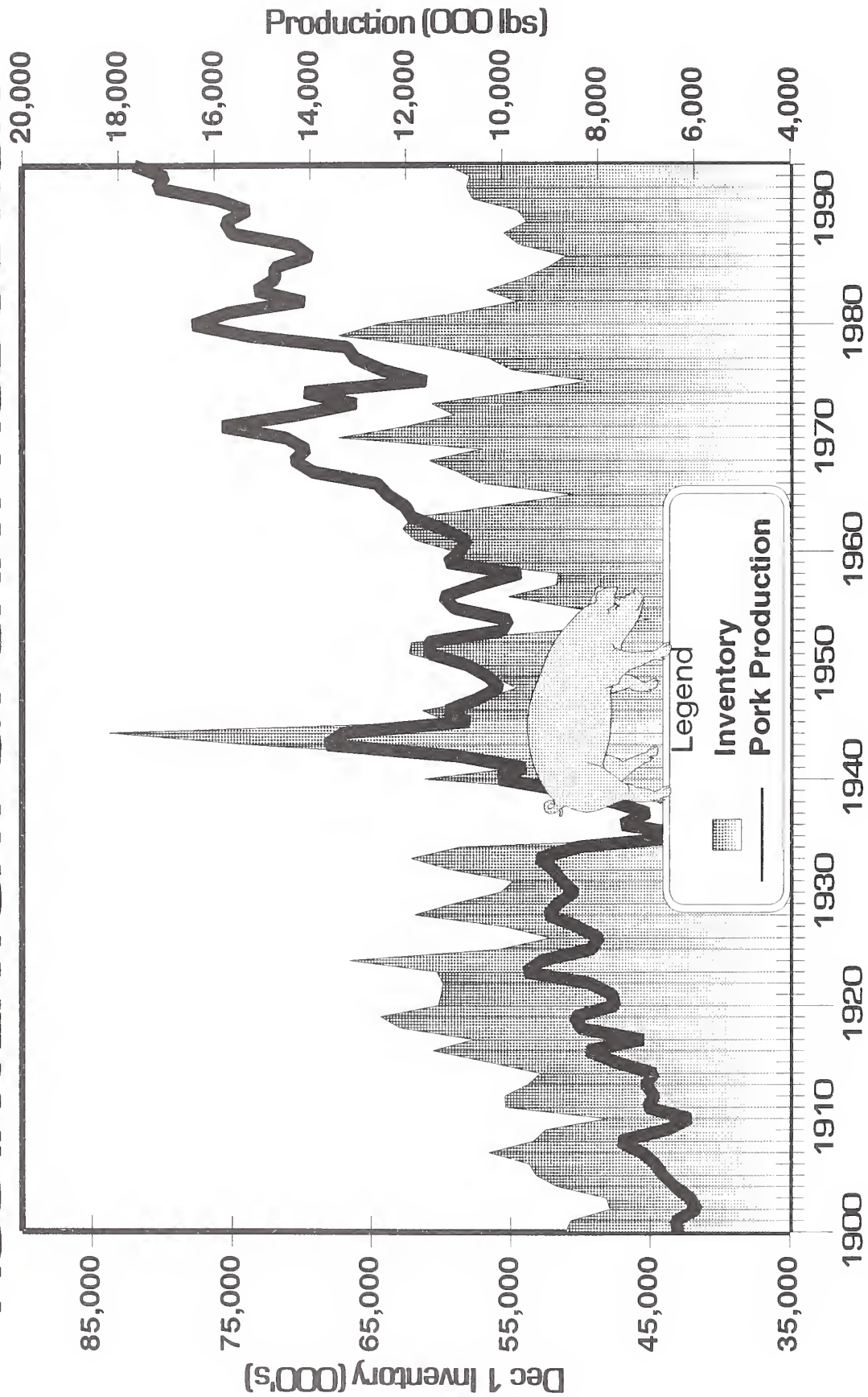
Agri Economic Research & Advisory

Cattle Inventory & Cow-Calf Returns



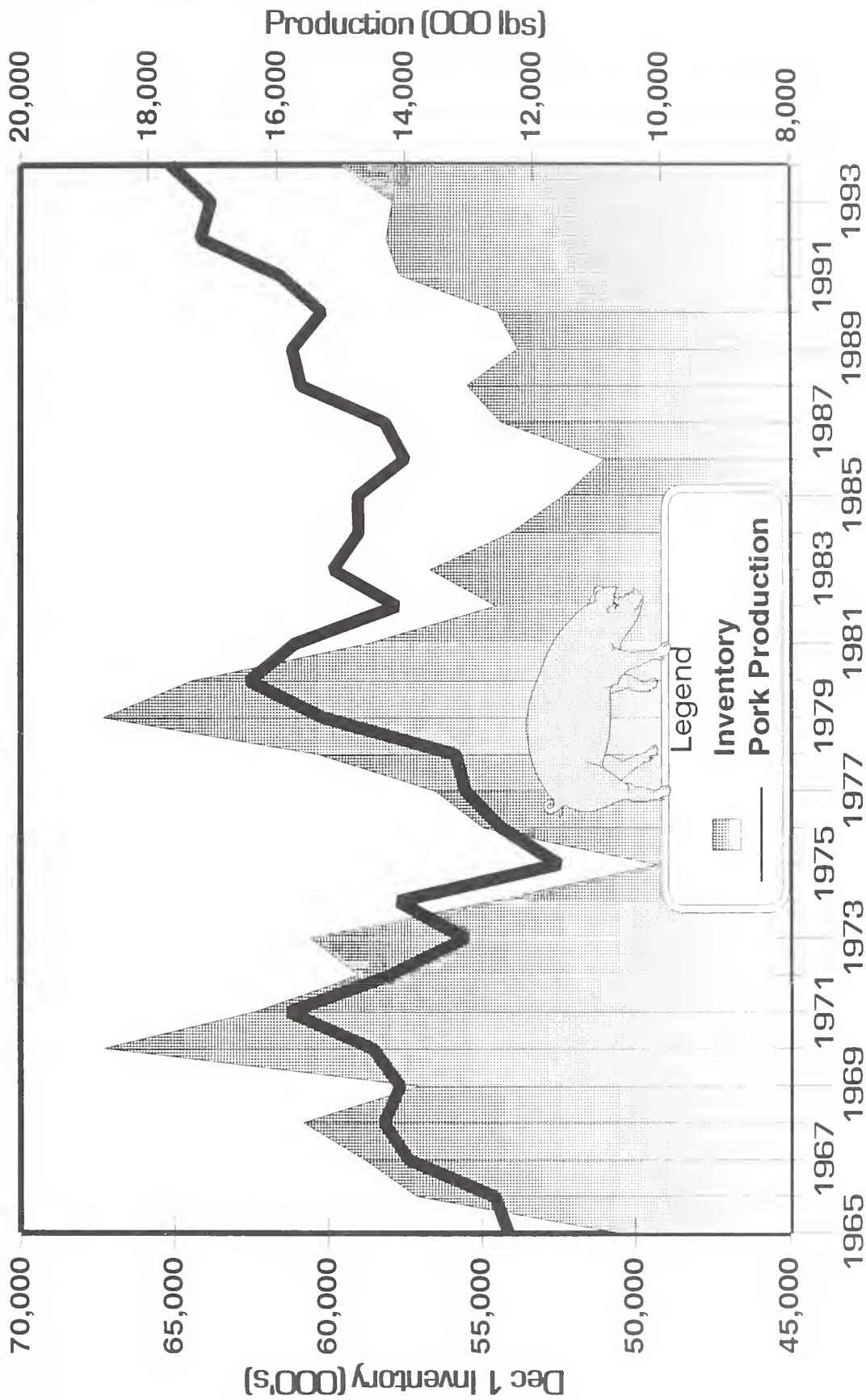
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HOG INVENTORY & PORK PRODUCTION



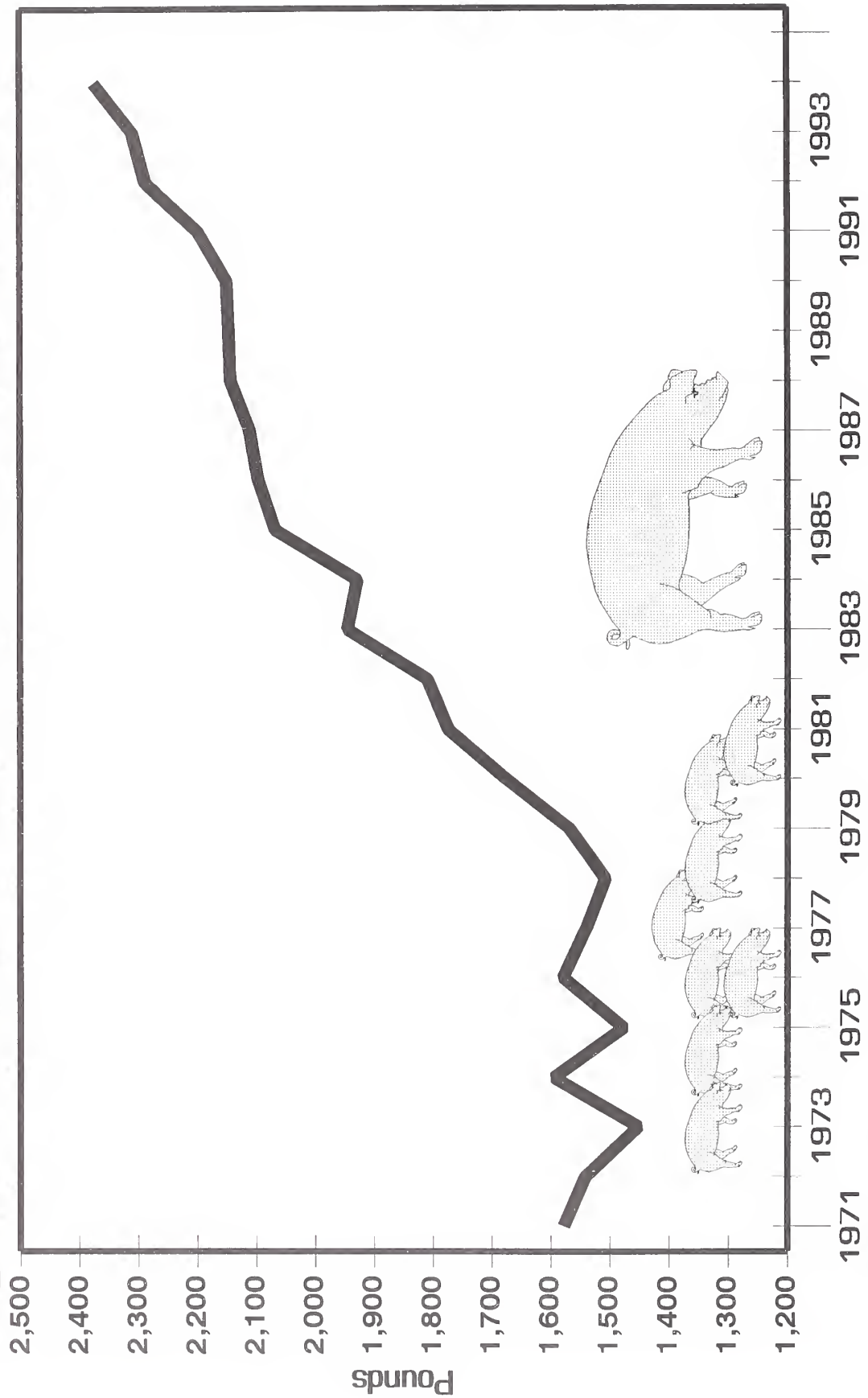
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HOG INVENTORY & PORK PRODUCTION



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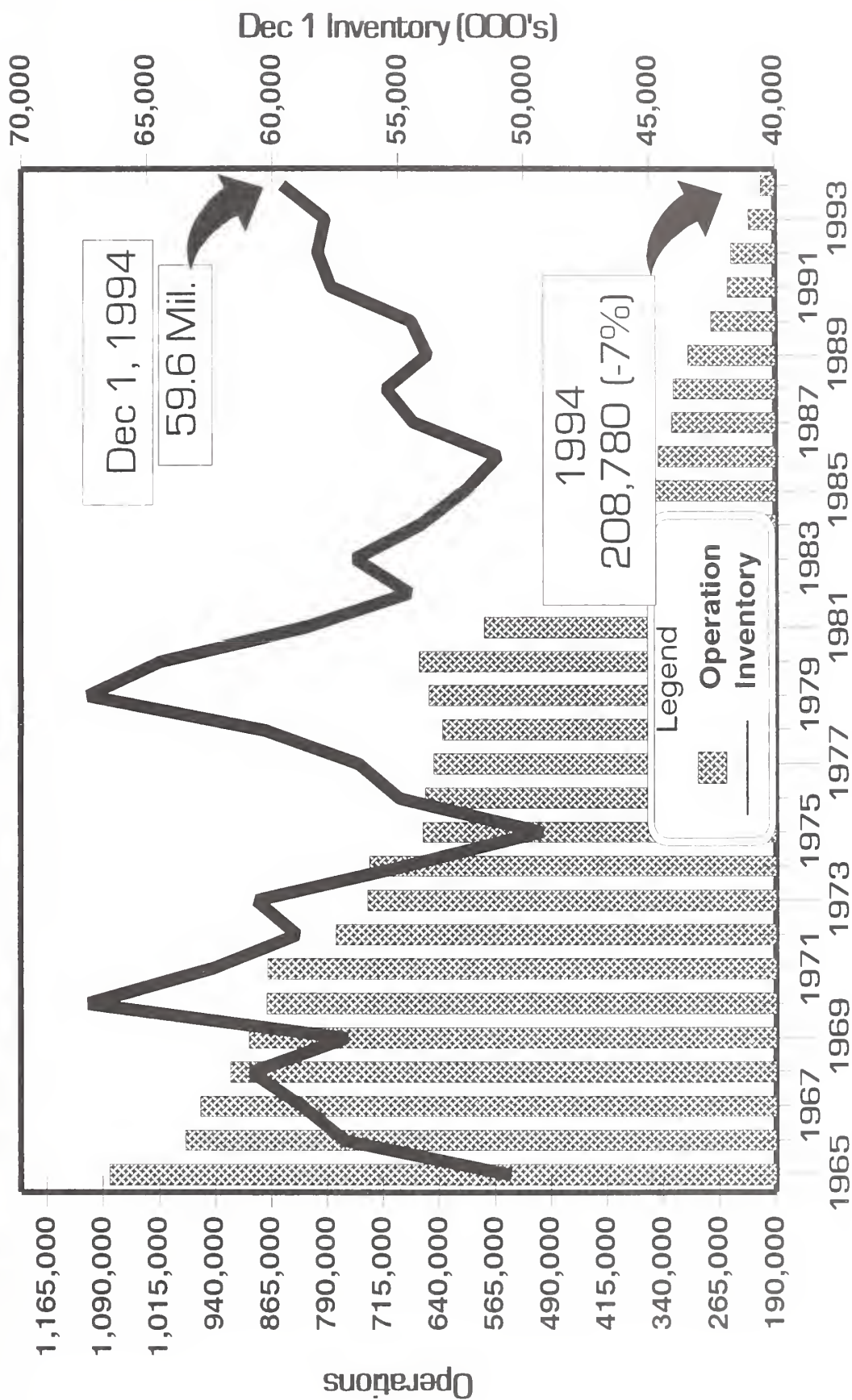
PORK PRODUCTION PER BREEDING SOW



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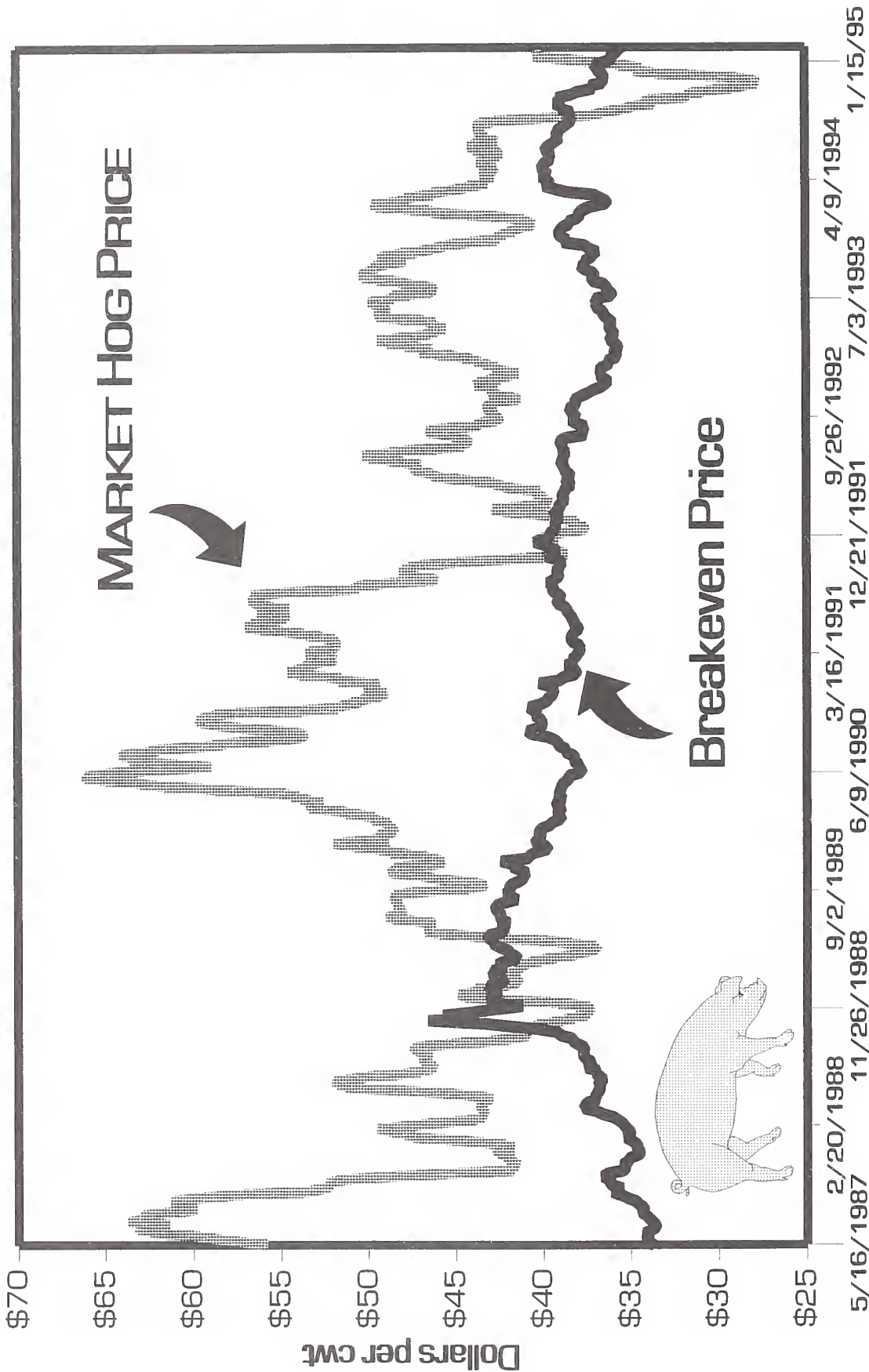


HOG PRODUCER CONSOLIDATION



Agri Economic Research & Advisory

ECONOMICS OF HOG FEEDING



Marketing Week



Agri Economic Research & Advisory

Agricultural Outlook Forum
USDA's Outlook for Livestock and Poultry

Steve Reed
Economic Research Service, USDA

It has been nearly 3 months since the numbers generated for the livestock component of the baseline publication were submitted. Since that time, new information has altered the short to intermediate term outlook for several of the meats. My task today is to provide you with the "revised" outlook for red meats and poultry in 1995 and beyond. An appropriate title for this talk might be **If I Could Do It All Over Again...**

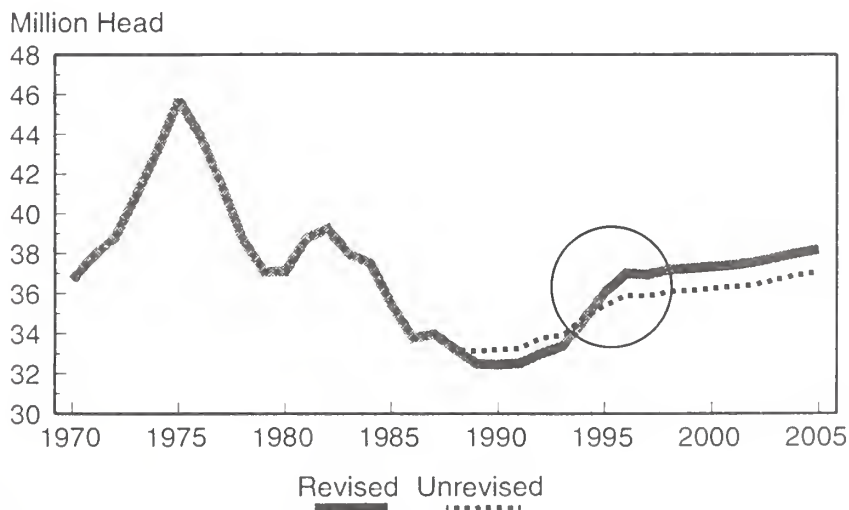
Beef -

Beef production in 1995 is expected to rise only marginally above the published baseline. However, revised estimates of the cattle inventory for 1989-94 and first estimates of the January 1, 1995 inventory suggest a quicker rate of expansion in the beef cow inventory than had been anticipated.

The 1996 cattle inventory could rise 1-2 percent from the baseline projections. **Much larger beef supplies and lower prices are likely in 1996 than projected earlier.** Expansion phase of the cattle cycle will continue for at least 2 more years followed by a reduction of breeding stock and smaller calf crops due to several years of marginal to negative returns to the cow calf sector.

Beef Cow Inventory

January 1



Pork -

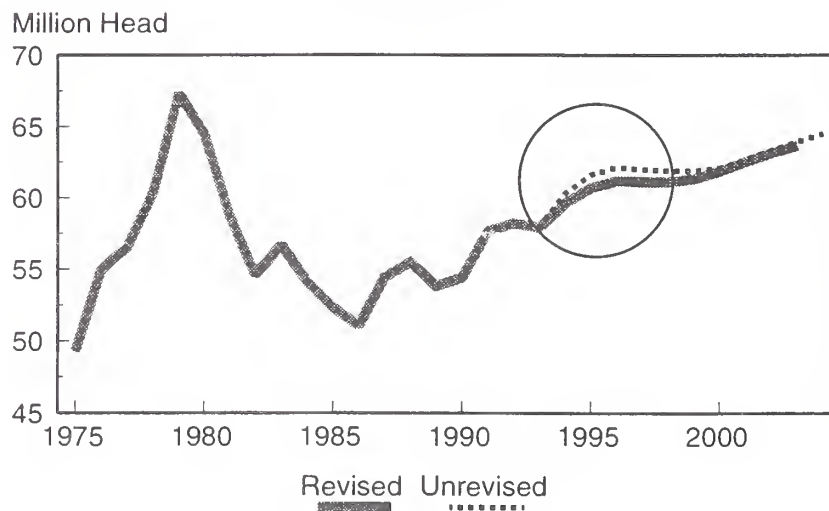
Pork production will remain record large in 1995, but was revised down 3 percent from the 1995 baseline projections based on the December **Hogs and Pigs** report.

Producers responded more quickly than expected to negative returns in the fourth quarter of 1994 by reducing breeding herds and limiting future farrowings.

Year over year declines in farrowings are expected to continue through at least the first half of 1995. **Lower pork supplies and higher prices now are projected for 1995 and 1996 than published in the baseline.**

Hog Inventory

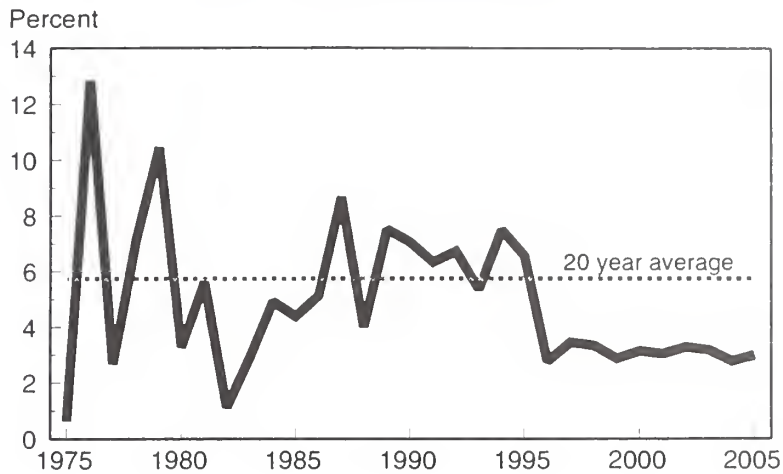
December 1



Broilers -

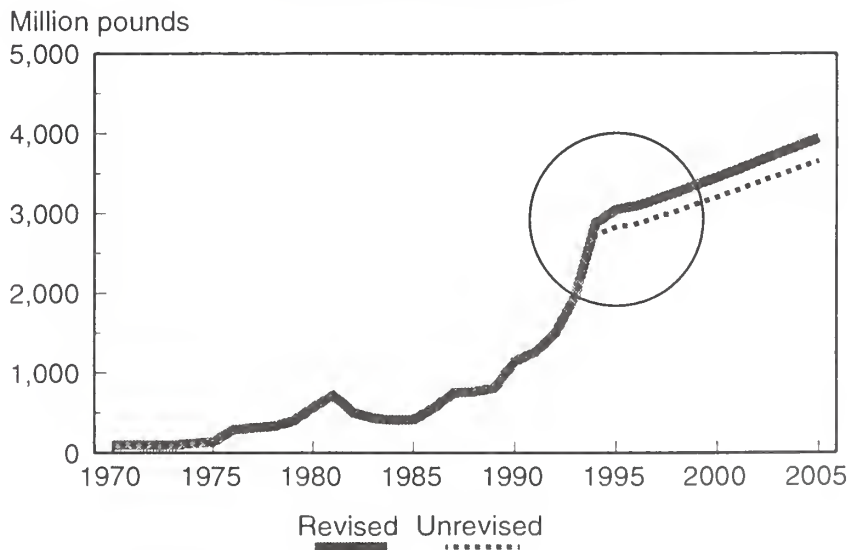
Production for 1995 currently is forecast to rise about 1.5 percent above the baseline estimates. Broiler production increases through the year 2005 average about 3 percent per year. These projections may be too conservative, and if understated, would pressure prices across the meat complex.

RTC Broiler Production
Percent Change From Year Earlier



Broiler exports increased sharply in 1994 as shipments to the former Soviet Union (FSU), and Hong Kong continued to expand. Export estimates for 1995 have increased nearly 8 percent from the baseline projections. Exports in future years also may be under stated.

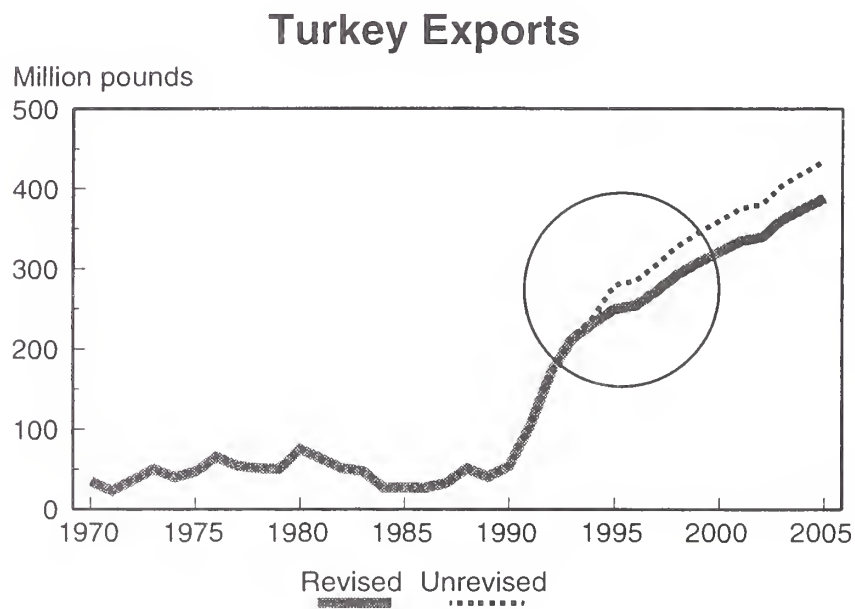
Broiler Exports



Turkey

Production forecasts are little changed from the baseline, but the trade matrix has been altered to reflect the impact of the peso devaluation in Mexico.

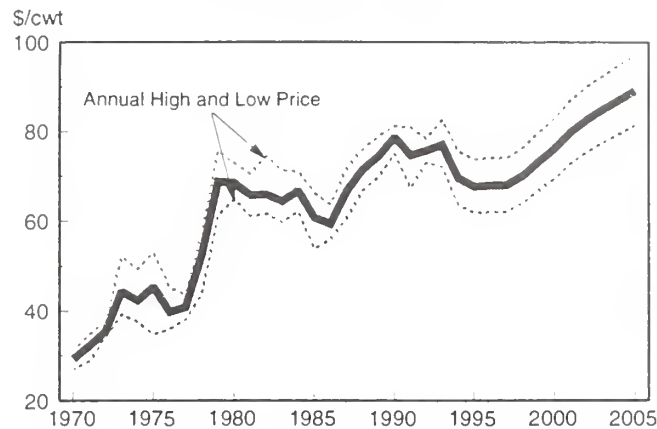
U.S. turkey exports to Mexico grew sharply in recent years, accounting for nearly half of 1994 shipments. The devaluation of the Mexican peso will curtail U.S. turkey meat exports in the short run by as much as 15-20 percent. Other markets are expected to absorb some of the dark meat, but total exports for 1995 have been lowered nearly 10 percent from the baseline projections. Longer term, the Mexican market is expected to remain an important customer for U.S. turkey meat.



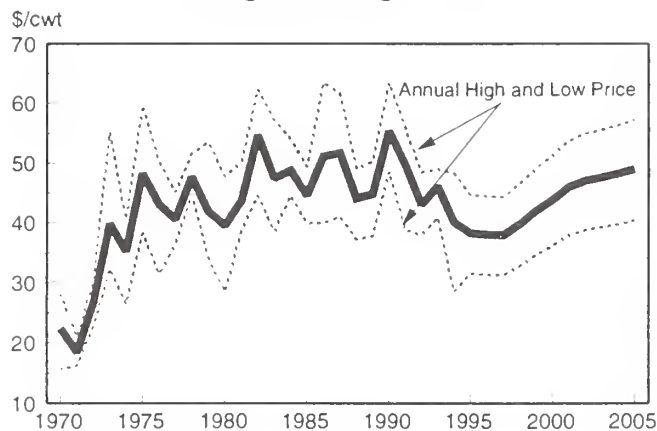
Price Volatility -

Price projections accompanying each of the tables **do not reflect potential volatility in the markets during the year, which historically has been relatively wide, and has not noticeably diminished.** Using monthly data from the past 25 years, the average minimum/maximum price has ranged as follows; Beef 9%, Pork 17%, Broilers 12 %, Turkey 18%.

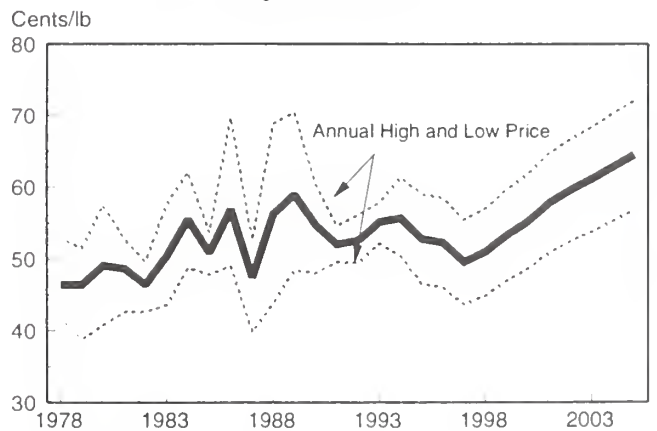
Fed Steer Price



Slaughter Hog Price



12 City Broiler Price



	1992	1993	1994	1995
	Annual	Annual	Annual	Annual
Production, million lb.				
Beef	22,968	22,942	24,282	24,625
Pork	17,184	17,030	17,661	17,925
Broilers	21,052	22,178	23,837	25,400
Turkeys	4,829	4,848	4,992	5,290
Total Red Meat & Poultry	67,193	68,107	71,881	74,178
Eggs, mil doz.	5,905	6,003	6,177	6,275
Per capita consumption, Retail lb.				
Beef	66.5	65.1	67.6	68.4
Pork	53.1	52.3	53.1	53.8
Broilers	66.6	68.3	69.9	73.8
Turkeys	18.0	17.8	18.1	18.7
Total Red Meat & Poultry	208.4	207.6	212.5	218.0
Eggs, number	235.8	236.2	238.5	239.4
Market Prices				
Choice steers, Neb., \$/cwt.	75.36	76.36	68.84	65-70
Feeder steers, Ok City, \$/cwt.	81.76	86.46	77.72	71-77
Brk Ut Cows, S. Falls, \$/cwt.	44.84	47.52	42.50	38-41
Barrows & gilts, Ia/Mn., \$/cwt.	43.03	46.10	40.06	37-40
Broilers, 12 City, cents/lb.	52.6	55.18	55.69	51-55
Turkeys, Eastern, cents/lb.	60.2	62.55	65.65	59-63
Eggs, New York, cents/doz.	65.4	72.53	67.25	64-68
U.S. Trade, million lb.				
Beef & veal exports	1,324	1,275	1,581	1,735
Beef & veal imports	2,440	2,401	2,387	2,485
Pork exports	407	435	540	495
Pork imports	645	740	744	730
Broiler exports	1,489	1,966	2,845	3,050
Turkey exports	171	212	235	250

PRICE DISCOVERY AND MARKET ACCESSIBILITY -
HOW ARE THEY CHANGING?

Clement E. Ward
Professor and Extension Economist, Oklahoma State University

Introduction

My remarks consist of observations, perceptions, and hypotheses based on my knowledge and experience over the past two decades. This paper covers much more than I can address in the time allowed. Frankly, I have used this opportunity to put some thoughts on paper which I have not done in the past.

Concepts and Focus

Price discovery seems to be an often used but seldom defined concept. I prefer a textbook definition from the 1950s: Price discovery is the process of buyers and sellers arriving at a transaction price for a given quality and quantity of a product at a given time and place. Thus, in talking about price discovery, we also involve numerous interrelated concepts and topics, including market structure-conduct-performance, market information and price reporting, thin markets, buyer competition, market access, value-based marketing, and vertical coordination. The degree to which some of these topics are issues for the livestock and poultry industries varies by species.

The focus of this forum is on long-term trends and implications. First I will review selected changes over time for the livestock and poultry industries. As a base, I will use the structure-conduct-performance paradigm which undergirds antitrust laws and regulations in the U.S.

Market Structure Changes

Market structure (or industry structure) refers in part to the number, size, and location of firms in an industry. Industry structure is dependent on several factors, among them consumer demand for products marketed and economies of size for firms in the industry. Perhaps the focal point in the marketing channel for structural changes has been the processing stage. Structural changes centered there have affected other production and distribution stages in the marketing channel.

The beef and lamb industries both experienced rapid structural changes in the 1970s and 1980s. Economies of size in slaughtering and processing, combined with declining demand for beef and lamb, resulted in a sharp trend toward fewer, larger, and more cost-competitive plants. Takeovers and acquisitions, spinoffs and divestitures combined to result in a consolidation among firms, leaving relatively few, large, highly concentrated processing firms. The pork industry has experienced similar changes, but more recently than for beef, in the 1980s and 1990s. Declining demand and economies of size were two of the driving forces in the pork industry as well. However, the extent of consolidation and concentration in pork has not reached the level of beef and lamb. Another driving force was sheer profitability in producing hogs during the late-1980s and early-1990s.

Both in the production stages of the beef, pork, and lamb industries and on the other end, at the retail distribution stage, there have also been changes. In particular, we have seen a sharp reduction in the number of firms and a coincident increase in size of firms which have continued in business.

The broiler and turkey industries experienced some of the same changes, but to a lesser degree and in a different time period. First, many structural changes in broilers and turkeys arose in the 1950s and 1960s, well ahead of similar changes in beef, pork, and lamb. Second, the driving forces for changes during the last two decades were not the same for the poultry industries as for the red meat industries. Declining consumer demand was not a problem. In sharp contrast, the quantity of broiler and turkey products demanded by consumers has continued increasing the past two decades. Economies of size in processing was not as important to recent consolidations among firms as other factors, perhaps economies of scope and distribution.

Market Conduct Changes

Aspects of market conduct (or market behavior) addressed here involve pricing behavior; such as live animal marketing and purchasing practices as well as consumer products marketing. Vertical coordination is a broad term for the process of coordinating or ordering the flow or movement of commodities and products between two or more stages in the vertical market channel from farm-level production to consumer use. Market prices are one method of vertical coordination. Another method is vertical integration, which can be by ownership or contract between two firms at adjacent stages in the marketing channel. Formula pricing usually falls within the category of contract integration. Formula or contract prices typically are not released to private or public price reporting services.

Price discovery becomes an issue as a higher percentage of trades are conducted by contract or ownership integration and away from spot price transactions. Market prices, voluntarily reported to private and public organizations by firms in an industry, provide considerable information needed to make subsequent marketing and purchasing decisions. However, due to structural and behavioral changes, the amount of available market price information may decrease and potentially disappear. Price discovery then becomes a major issue. Fewer and fewer reported prices become the price base for more and more volume, one component of a thin-markets problem.

In a similar manner, market access becomes more of a problem as market structure trends toward fewer and larger firms, and as market behavior trends toward vertical integration. Firms not engaged in contract or ownership integration may find themselves unable to market/purchase products from firms that are vertically integrated. This may be increasingly evident as we attempt to move closer to value-based marketing. Producers who do not produce the quality of products that prices signal or integrated firms indicate, may find market access severely limited.

Spot prices have been the traditional coordinating mechanism in the beef industry for decades. The percentage of trades coordinated by market prices probably decreases as one moves from feeder cattle marketing, to fed cattle marketing, to wholesale beef marketing. There is only a small percentage of feeder cattle volume coordinated by vertical integration, either contract or ownership integration. However, the percentage has likely increased slightly in recent years. Only in the past decade has the percentage of trades coordinated by spot prices begun to decline significantly for fed cattle. In the past five years or so, about 20 percent of all transactions are vertically coordinated by contract or ownership integration. Data on the percentage of beef marketed under contract to retail supermarkets and food service firms and institutions are scarce, but the percentage is believed to be higher than for fed cattle.

Until the past few years, spot prices also were the primary coordinating mechanism in the pork industry. Integrated farrow-to-finish operations are common in the pork industry. However, with the increase in larger, contract production units, the volume of independent feeder pig production has declined. For independent feeder pig producers, most feeder pigs marketed are coordinated

by spot prices. A relatively small percentage of hogs have been marketed under contract or ownership integration for many years, probably less than 5 percent. However, in the past five years, the percentage has increased sharply and will continue to increase during the next few years. The percentage of slaughter hogs produced or marketed under contract was about 15 percent in 1991 and may be over 20 percent today, probably heading to 25-30 percent in the near future. As with beef, data on the percentage of pork marketed under contract to retail supermarkets and food service firms and institutions are scarce, but the percentage is believed to be similar to beef.

Market prices are the primary coordinating mechanism for feeder lambs. While spot prices are still the primary coordinating mechanism for slaughter lambs, 30 percent or more of slaughter lambs are marketed under some type of vertically integrated arrangement. My perception is that a smaller percentage of lamb is marketed by vertically integration from packers to retail and food service distributors than for beef and pork.

The existing poultry industries are a sharp contrast to the red meat industries. Nearly all poultry production is coordinated by contract or ownership integration. In essence, there is no spot market for live poultry. Prior to the disappearance of the live poultry market, price discovery for live broilers and turkeys was undoubtedly a problem. While data are not readily available, the percentage of broiler and turkey products marketed under a vertically integrated arrangement from integrated poultry firms to retail and food service outlets may be considerably higher than for the red meats.

Price discovery and market access issues are much more serious for some industries than others. Price discovery and market access are more serious for feeder pigs, as large, corporate hog operations increase in importance. These issues are becoming increasingly important for fed cattle, slaughter hogs, and slaughter lambs, as larger production units become vertically tied to large processing firms. Publicly-reported prices are gradually disappearing. Thinly reported markets are becoming more common. Price discovery and market access are not serious issues for feeder cattle, but price discovery is more of a problem for feeder lambs.

Price discovery is not a problem for live poultry production, since there is no market and no market prices. Market access is a separate issue. The market access issue is one of whether or not contract growers can contract with other integrators when they become dissatisfied with their current contract processor or with their current contract terms. Growers have complained and alleged that they lack the ability to negotiate contracts with other processors.

The degree of concern regarding price discovery increases somewhat for nearly all meat products. The type of concern shifts to lack of market price information on which to base spot transactions and formula-priced contract transactions. This aspect of price discovery is becoming a greater concern for fed cattle and slaughter hogs also. Thus, a major area of concern related to price discovery is the availability of information, especially price information, on which to make marketing and purchasing decisions.

Market Performance

Market performance refers to measuring such things as profitability of firms in an industry and their return on investment. Increasingly, we have less and less information about market performance of livestock and poultry industries as we move toward more consolidated and concentrated industries. Privately-owned firms do not report performance information publicly, and some publicly-owned firms only report consolidated financial reports but not reports by commodity or product groups. Therefore, it is difficult to monitor or track performance of firms in the livestock and poultry industries.

Long-Term Trends and Implications

The accompanying diagram attempts to provide a simplified perspective to the previous discussion. Two factors, I believe, affect or influence the presence of and degree of price discovery problems; consumer demand and product supply relative to processing capacity. Consumer demand may be strong or expanding vs. weak or declining. Relative supply may be large or expanding vs. small or declining. Let's compare the red meat industries with the poultry industries using this conceptual framework.

PROJECTED PRICE DISCOVERY AND/OR RELATED PROBLEMS

Relative Supply ¹	Consumer Demand	
	Strong or Expanding	Weak or Declining
Large or Expanding	2. Possible But Small Problems	4. Probable Problems
Small or Declining	1. No Problems	3. Possible And Growing Problems

¹ Supplies relative to processing capacity

Cells numbered one and two represented the livestock industries for several years prior to 1980. There were rather sharp cyclic supply periods but demand for the most part was strong and expanding. Price discovery was not a major concern. Cell two depicted the status of the red meat industries during the last half of the 1970s. Since about 1980, demand has been weaker and declining. Supplies relative to processing capacity declined in the 1980s. Thus, the red meat industries moved toward cell three. Over the past couple years, the beef and pork industries have moved into cell four. Price discovery began to be a concern in the 1980s (cell three), but is a bigger concern today (cell four). Cyclic production continues. Price discovery is a bigger concern during the current period of large and expanding supplies.

The poultry industries again lie in sharp contrast to the red meat industries. For broilers and turkeys, the 1950s and 1960s were periods of weak or declining demand. Supplies may have varied somewhat, thus placing both industries in cells three and four. Then during the 1970s and continuing today, demand strengthened and structural and behavioral changes occurred, resulting in a move from cells three or four to cells two or one. The broiler and turkey industries today are likely in cell two.

Thus, price discovery concerns which were undoubtedly present in the 1950s and 1960s for poultry industries, nearly disappeared with improved consumer demand combined with structural and behavioral changes of the firms involved. For the red meat industries, declining demand combined with structural and behavioral changes have created price discovery concerns.

Are the red meat industries in a transition period? Are price discovery concerns limited to those industries transitioning toward more consolidated, more vertically integrated industries? After the transition is completed, some type of price discovery concerns disappear. However, during the transition period, interim measures are needed to ease the transition.

Which market structure and behavior combination is better or worse, the poultry industries model or the red meat industries model? Or are they just different? Who are the clear winners and losers?

Most would argue that consumers are winners in the case of poultry, receiving abundant supplies of a variety of products at reasonable prices. Some may argue that consumers are or will benefit from structural and behavioral changes in the red meat industries as well. Some would argue that producers and the environment are losers in the poultry industries. Those same individuals or groups might also argue that producers and the environment are losing or will lose in the red meat industries too. How we perceive winners and losers depends in large part on our perspective.

Concluding Remarks

Market structure and behavior of the livestock and poultry industries has been and remains dynamic. Price discovery and market access issues facing the livestock industries today were present in the poultry industries during the transition from a price-coordinated market to a vertically-integrated market in the 1950s and 1960s. Stronger consumer demand and structural and behavioral changes in the poultry industries eliminated some of the price discovery problems which existed, albeit potentially creating other concerns. Perhaps the livestock industries simply need to consider what interim measures are needed during the transition to a market environment more dependent on vertical integration than market price coordination.

PRICE DISCOVERY- A NARROW ECONOMIC ISSUE

John Ginzel

Director of Risk Management, Thorn Apple Valley, Inc.

I am glad to be here today. I will approach this discussion from two different perspectives: As an economist and as a practitioner.

As an economist, I see the food sector as a series of interconnected value adding functions for the production and delivery of food from producers to consumers. Within this framework, price discovery is a narrow economic issue. The broader economic issue is how the marketplace rewards these functions. Market forces will determine how these functions are best organized within firms and among firms. Likewise, price is a narrower concept than value or worth.

For example, let's contrast the value adding functions performed to two dozen eggs. One dozen was purchased from a supermarket in New York City. The second dozen a farmer takes them from his laying house into his household. Each household received a similar product, a dozen eggs. But, many more value adding functions were performed to the dozen eggs purchased in New York City compared with the farmer's dozen eggs. The dozen in New York has more time and place utility. In fact, the two dozen eggs could have been produced by the same flock!

Behavior can be analyzed as the interactions between structure, conduct and performance.

Many forces determine how value adding functions are organized. Shortly after the dinosaurs disappeared from the face of the earth, when I was in graduate school, Structural Economists developed frameworks as aids to analyzing and hopefully better understanding economic systems. Bain developed a very useful framework to gain insight into behavior by looking at the interactions between structure, conduct and performance.

Some examples will help illustrate how this framework can be used.

Prior to World War II (WW II) most large scale hog and cattle slaughter plants were located near major cities close to terminal stockyards. Presently, very few slaughter facilities are located near major cities, and a relatively small proportion of the livestock is now sold through terminal stockyards. Most recently constructed slaughter plants are located closer to the livestock producer. Why? What has changed between then and now? Some of the major factors behind this shift are:

- 1) Changes in transportation costs and systems

- Prior to WW II most longer distance transportation services were mostly by railroads rather than by over-the-road trucks. The pre-WW II economy was handicapped by a very poor road system. This raised the costs and the time required to move products compared with the present interstate highway and railroad systems. Shortly after WW II, a story is told how General Eisenhower took a caravan of army trucks from the East Coast to the West Coast. It took him more than 20 days. Some view this as one of factors that helped to push the federal government into making the massive infrastructure investments for the Interstate Highway system. It was politically justified as a national security issue.

2) Changes in food handling technology

- Refrigeration and food handling technology advances permitted the “perishable meat” to be much further from the consumer. In the earlier period “fresh meat” was more perishable than live animals. Now, live animals are more perishable than meat.

3) Changes in the labor markets

- Prior to WW II, meat packing was more labor intensive than now and required access to a large labor pool. Being located near major cities provided access to substantial labor pools. Now many workers drive many miles to work in slaughter and processing plants located in rural areas.

An other example is hog farms today often market significantly more hogs per year than in the past. A large hog farm in the early 1960's marketed over 1000 hogs per year. Now, a number of “mega-hog operations” market over 100,000 hogs per year. Why? What has changed? I would point toward livestock handling and disease control practices that now allow hog farmers to concentrate larger numbers of hogs at the same location. Previously, disease control was much less effective and individual operators kept smaller herds and often rotated hog pastures. Developments in disease control, improved breeding practices, production facilities and animal nutrition have all contributed to allowing today's “mega-hog operations”. I can point toward an old saw--“A chain is only as strong as it's weakest link.”

The time span for an economic activity to adjust can influence how market participants behave. I will arbitrarily describe a few different time spans as:

- the very short term -- within one day,
- short term -- within one week or less,
- intermediate term -- a quarter or less,
- longer term -- a year or more, and
- very long term -- greater than a 5 year horizon.

An example will illustrate how different time spans can influence price discovery and market participant's behavior. I recently was buying wholesale bone-in hams for a major food company. The ham trading desk would typically receive orders for the number of truck loads needed from each facility early in the week for the next week's daily production schedule. (A truck load of bone-in hams weighs between 38,000# to 42,000# and is from about 1000 hogs.) I was responsible for purchasing the best value to meet each production plant's needs. Notice, I said value not price. A buyer's behavior is influenced by many different forces not obvious to an outside observer.

When buying wholesale hams, I would collect information about who was offering hams, offering prices, cut dates available and locations before starting bidding. (Cut date refers to when the packer breaks chilled hog carcasses into primal cuts and is usually 24 hours after slaughter.) I would normally buy wholesale bone-in hams three to six days prior to the plant's scheduled needs. Hams scheduled for processing on Monday and Tuesday would typically be purchased by the previous Tuesday through Thursday. Cut dates would usually be specified not to be older than Thursday and preferably Friday or Saturday.

This example will illustrate how the span of time involved influences a buyer's behavior and prices. I vividly remember one day when a plant production manager called with some urgency in his voice at about 1:00 PM. He said the pork carcass cutting room had had a break down. And as a result, the second shift ham boning room would be running out of hams for processing by about 7:00 P.M. that evening. Could I find him a couple of loads for the second shift before 7:00 P.M.? I told him I would try.

I was a trapped buyer with few alternatives for a few loads of hams. I figured that the company would be ahead if these hams could be purchased and delivered in time at 5 to 8 cents per pound more than the prevailing market rather than miss the production schedule and be forced into overtime on Saturday and an additional cleanup. First, frozen hams could not be thawed quickly enough to be ready in a few hours. Second, I did not have any hams in transit that could be diverted from an other plant to arrive in time. Next, I called sellers representing nearby hog kill/cut plants. Price was not the major consideration, availability of hams was. I was in luck, a sales person representing a nearby plant was offering a few loads of hams for prompt shipment. I purchased two loads, and one load was delivered by 5:00 P.M. that afternoon. The seller thinks I did him a big favor for taking two loads of hams off his hands at only a 4 cent per pound discount. He perceived himself as a "weak hand seller" and was unaware that I was a "trapped buyer".

The insight I want to leave with this example is---many factors influence a reported price in a market place. The reported price only represents the agreed upon selling price between the buyer and the seller. Conditions behind the transaction motivating the buyer and the seller are not reported.

Usually a price quote for a market gives limited insight into the volume traded or the liquidity within the market place. More liquidity in a market place is desirable. For example, if I have a 20 lot position to be filled in Live Hogs options or Frozen Pork Belly options and the other side of my trades only has desire to take on an exposure of a one lot, I will only get a partial fill.

In summary, I see price discovery as a narrow issue relative to how the market rewards the different interconnected value adding functions within the foods sector. It does not matter if the value adding functions are done by one firm or by several firms. Also, I expect that most consumers find better value in buying fresh eggs from the supermarket rather than keeping a few laying hens.

OUTLOOK FOR TOBACCO AND PEANUTS

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Tobacco and peanuts are important crops worldwide. U.S. production of both crops has long been influenced by agricultural legislation. With a 1995 Farm Bill to be considered by Congress, tobacco and peanut interests have a stake in the outcome.

Tobacco and peanuts have long been important crops in major producing States. About 125,000 farms produce tobacco and 16,000 farms produce peanuts with crop values in 1994 of \$2.8 billion and \$1.2 billion, respectively.

Cyclical swings in prices in the early part of this century led to grower efforts to control production. The nongovernmental efforts failed and in 1933 the Federal Government began support of farm income through various annual farm commodity programs. The Agricultural Act of 1938 established supply control and price support for certain commodities, including tobacco; peanut allotments were first authorized in 1941. Grower approval in a national referendum for peanuts and each kind of tobacco makes Federal support mandatory in combination with marketing quotas.

Financial resources for carrying out price support are provided by USDA's Commodity Credit Corporation, through regional producer associations. By limiting supplies of tobacco and peanuts, market prices are increased and in this way farm income is supported rather than through Government payments.

The looming question affecting outlook is: "What shape will the tobacco and peanut programs take after 1995?" The issue of those programs' effects on farm production, consumption, and international trade are now linked to wider issues of downsizing the Federal Government and how to achieve a balanced budget. Before tackling the longer range prospects for tobacco and peanuts, let's first focus on this year and the year ahead.

Tobacco

Last year, the most notable development for U.S. tobacco growers occurred on December 1 when five U.S. cigarette manufacturers agreed to purchase the nearly 700 million pounds of surplus flue-cured and burley tobacco inventory at a discount from the three loan

associations. As part of the contracts, which run for seven years, manufacturers are entitled to additional discounts if they maintain their purchase intentions in outyears and actually fulfill their intentions. As a result of those purchases, which sharply reduced unsold loan stocks, along with increased buying intentions, marketing quotas went up for this year—16 percent for flue-cured and 1 percent for burley. Growers may sell more tobacco in total this year because of the gain for flue-cured; with the drop in effective quota, burley sales may decline slightly. Price support levels have edged up, thereby helping growers obtain prices near the past season's near record high. Production costs are expected to continue to increase.

For other tobaccos, the current marketing year's supplies of Maryland, fire-cured, and dark air-cured types are larger than last season, while supplies of cigar types are lower. Marketing quotas and acreage allotments for nine of these kinds of tobacco must be announced by March 1.

Growers raised 1 percent less tobacco in 1994 than the previous year. But larger flue-cured and burley carryover stocks increased supplies for the 1994/95 marketing year by 4 percent. With stronger auction demand, a smaller volume of tobacco went under price support loan. The average tobacco price of \$1.78 per pound was up about two cents per pound, but remains below the record high set in 1984.

With a sharp gain in exports, U.S. cigarette output reached 685 billion cigarettes last year, nearly 4 percent above 1993. The number of cigarettes consumed per capita, 18 years and over, in 1994 was about 2,493 (125 packs)—a 2 percent annual decline, but the smallest annual drop since 1984. Lower cigarette prices are apparently a major factor. But this year the restrictions on where people can smoke, continued anti-smoking activity, and health concerns mean the per capita decline will likely continue.

Retail cigarette prices averaged 3.5 percent lower in 1994, due to manufacturers decreasing premium brand prices in mid-1993. However, this year some price increases are likely. State excise taxes average 31 cents per pack and range from 2.5 cents in Virginia to 75 cents in Michigan. The Federal excise tax remains at 24 cents per pack because proposals for higher taxes linked to health care reforms did not pass in the 103rd Congress.

Among other tobacco products, the biggest development last year was the small rise in large cigar output after decades of decline. Output remained around 2.2 billion for the fourth year in a row as higher price-cigars now dominate total volume. Smoking and chewing tobacco output dropped further while snuff production rose for the seventh year in a row.

U.S. exports of tobacco and tobacco products in 1994 of about \$6.7 billion jumped sharply over 1993 because cigarette exports were up smartly to a record high. However, unmanufactured tobacco exports stagnated around \$1.3 billion. In recent years, leaf and products exports have taken about one-half of the U.S. tobacco crop. U.S. tobacco leaf and

products exports provided a substantial surplus over tobacco imports worth \$1.0 billion last year, thereby relieving some of the pressure on the overall U.S. balance of payments deficit.

In 1994, exports of unmanufactured tobacco were 5 percent below a year earlier due to ample world supplies of leaf at lower prices than in the United States. Both flue-cured and burley shipments were down. Most of the decline was accounted for by declines in the European Union; Japan took more tobacco.

World cigarette production continues to rise and the demand for light tobacco for blending—primarily flue-cured and burley—is gaining in other countries. Last year, foreign flue-cured and burley crops dropped as major producing countries cut back production in response to low prices and excess supplies. More favorable price prospects are boosting southern hemisphere crops this year so U.S. exports will likely remain depressed.

Last year, U.S. unmanufactured tobacco imports fell about one-third but the United States remains the world's largest tobacco importing country. Much of the decrease last year occurred because manufacturers and dealers withdrew large quantities from bond in December 1993 ahead of the import assessments that became effective January 1, 1994. Also manufacturers took less tobacco due to the domestic marketing assessment ("25-percent law") that also became effective last January. An Omnibus Budget Reconciliation Act of 1993 (OBRA-93) provision limits foreign-grown leaf and stems to 25 percent of total tobacco used annually in cigarette manufacture. The Uruguay Round Trade Agreements Act (UR) repealed the "25-percent law" subject to the President proclaiming a tariff rate quota on certain tobaccos. Negotiations with various trading partners are still underway.

Longer Range Tobacco Prospects

The last three decades have seen dramatic changes in U.S. farm production capacity and in the mix and organization of production and marketing. Both technological developments in production and changes in consumer demand have spurred the adjustment. Developments affecting tobacco and prospective adjustments have been summarized in publications of the Tobacco Marketing Cost Study Committee (available from Department of Agricultural and Applied Economics, Virginia Polytechnic and State University, Room 325 Hutcheson Hall, Blacksburg, Virginia 24061-0401).

At least three forces of change with the potential to affect the Government and the tobacco industry sector affects the players (producers, processors, manufacturers, and consumers): (1) Continuing Federal budget deficit; (2) Adoption of "no-smoking" areas, health concerns, and declining social acceptance of cigarette smoking; and (3) continued erosion of U.S. market shares to low-cost foreign producers.

Even though the Administration's health care reform package stalled last year, it is highly likely that the Federal cigarette excise tax will increase in the near future, perhaps

phased in over several years with an eventual doubling of the current 24 cents-per-pack rate. Although opposed by a still relatively powerful tobacco-state congressional contingent, increases in tobacco taxes are supported by a large segment of the U.S. population and apparently not considered in the same category as excise taxes on "essentials" like gasoline.

The proportion of Americans who smoke continues to decline, social acceptance of cigarette smoking has waned, and publicity about relationships between smoking and health are ever growing. Publicity about the effects of smoking on nonsmokers is especially detrimental to the image of cigarette smoking.

The 1993 risk assessment report of the Environmental Protection Agency (EPA), "Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders" has received much publicity. The report has spawned an increasing number of restrictions on smoking in public places and has probably reduced public opposition to higher cigarette taxes. Organizations and companies representing several segments of the tobacco industry sued the EPA, challenging the scientific evidence that EPA used in concluding that secondhand smoke puts nonsmokers at high risk of cancer. The issue remains to be resolved in the Federal Courts.

In evaluating tobacco production and quota levels for flue-cured and burley tobacco over the next several years, baseline estimates assume the following: (1) Domestic cigarette consumption will fall about 2 or 3 percent annually because of tax increases and further social pressures; (2) Imports under a tariff rate quota are assumed to replace OBRA-93 provisions; and (3) With the present price support formula remaining in place, leaf exports will decline further as foreign producers expand output and manufacturers in our traditional export markets experience stagnant to declining sales volume.

Even if the Federal cigarette excise tax only doubles, its effect combined with factors already noted will cause domestic cigarette consumption to edge downward but an increase in cigarette exports will partially offset the effect on cigarette production. The result will likely mean a 15 to 20-percent drop in flue-cured and burley marketing quotas by 2000. Total U.S.-grown leaf use is expected to fall from 1.6 billion pounds in 1995 to around 1.5 billion pounds. Domestic leaf use could stabilize around 1.1 billion pounds; leaf exports are expected to fall about 15 percent to 425 million pounds.

A bigger tax increase would likely cause consumption and quotas to fall further below the baseline estimate.

Tobacco prices represent a current outlay for buyers and an input cost that manufacturers can control. As an example, before 1970, the United States supplied over one-half of the United Kingdom tobacco market, which was our major overseas customer. Over time, U.K. manufacturers developed other sources of supplies so our share since the mid-1980's has been only about 5 percent.

In the years ahead, the traditional marketing system could evolve to a more organized and rationalized basis, or contracting could develop between buyers and sellers as large farm operations become more numerous. A vigorous domestic tobacco production industry means manufacturers have an assured tobacco supply and an important political alliance for legislative considerations of tax and health issues. Present price trends do not favor exports, and our share in export markets is expected to continue to decline. The potential domestic market for tobacco will decrease in line with indicated consumer preferences. Domestic tobacco use will be tempered by manufacturers' willingness to use lower-cost supply sources, including imports.

Many of these comments deal with tobacco as a commodity, yet the adjustment of people, growers, warehouse operators, and buyers may be sizable. As a significant number of tobacco growers attempt to improve their income position, almost inevitably many will choose to leave the industry, or supplement their present incomes. Some may find increases in other crop or livestock enterprises the most desirable option. For many, off-farm employment in the area where they now reside would be the most desirable alternative.

Finally, with likely shifts in tobacco production as renting or lease and transfer become more widespread, communities may experience shifts in terms of population, tax base, and input-supplying businesses. Right now, the leadership of the industry as well as in the production areas have a challenge to examine the alternatives, develop a consensus, and implement those options offering the best opportunity.

Peanuts

The Crop Production 1994 Summary set the 1994 peanut crop at 4.26 billion pounds, about 26 percent larger than the drought-reduced 1993 crop, but slightly below the 1992 crop. Even with reduced acres, a boost in yield meant larger output. The U.S. yield was 2,643 pounds per acre, well above the previous year, but a little below the 2,692-pound average from 1981 to 1985.

With a jump in imports along with the large crop, the peanut supply for 1994/95 is 5.434 billion pounds, 14.5 percent larger than last year and about 2 percent above two years ago. Despite larger exports over last year and steady domestic food use, we will end the year with both a larger crush and higher ending stocks. Total peanut disappearance is expected to be up 15 percent to 4.23 billion pounds. Forecast ending stocks of 1.2 billion pounds would be about the average of the past two years.

Under the UR the United States has replaced the Section 22 import quota with an annual tariff-rate quota of 33,770 metric tons (MT) in 1995, which grows to 56,283 MT after 5 years. The United States has also established a tariff-rate quota of 19,150 MT for peanut butter imports that grows to 20,000 MT in 2000. High over-quota tariff rates will limit additional imports.

Peanuts used in primary products totaled 653 million pounds, shelled basis, for the first 5 months of the marketing year, down 3 percent from last year's 673 million pounds. The decrease occurred in the major categories of peanut butter, peanut candy, and snack peanuts.

Use of runner peanuts is up 3 percent compared with August-December of 1993. Use of Virginia and Spanish peanuts are down about one-fourth. Production and disappearance of roasting stock are virtually unchanged from last year. Domestic disappearance of roasting stock totaled 132 million pounds in 1993/94. Forecast domestic food use is 2.09 billion pounds.

August-November 1994 peanut exports totaled 397 million pounds, farmers stock basis, 58 percent above last season's slow start but a little below 1992/93's 431 million pounds. Exports in 1994/95 are forecast at 875 million pounds, based on greater availability, reduced foreign competition, and strong early season sales.

Forecast crush for 1994/95 is over 1 billion pounds, up by more than one-half from 1993/94. The larger crush will lead to larger peanut oil and meal supplies. Peanut meal prices have been strong but domestic peanut oil prices are higher due to the shortage of exportable supplies from other countries.

The national peanut poundage quota for the 1995 marketing year is 1.35 million tons, the same as last year and the minimum authorized by the 1990 Farm Bill. Legislation requires that the national poundage quota be set at the greater of 1.35 million short tons or a level that is equal to the estimated quantity of domestically produced peanuts that will be devoted to domestic edible, seed, and related uses in a marketing year.

The support rates for quota and additional peanuts are announced each February 15th. The quota support rate for 1995-crop peanuts is \$678.36 a ton and for additional \$132 a ton, the same levels as for 1994. The quota support rate is increased if costs of production (excluding land costs) rise, but the rate cannot increase more than 5 percent annually nor can the quota support be lowered.

Longer Range Peanut Prospects

After rising almost steadily during the 1980's, U.S. peanut consumption has leveled off and the domestic origin market has fallen with imports of peanuts and peanut butter now accounting for nearly 5 percent of the food use. Exports have followed a cyclical path depending on available supplies. The issues remain about the cause-effect relationships between industry performance and the industry structure that is heavily shaped by the price support and quota program.

For the budget estimates and baseline projections, the minimum national poundage quota of 1,350,000 tons is assumed to continue through MY 2000. A marketing assessment equal to 1.1 percent of the national average quota or additional price support rate for the 1994 and 1995 crops is required by the OBRA-93. This assessment rises to 1.2 percent for the 1997-2000 crops.

We also assume the quota support rate reflects the current statutory formula, e.g., the rate for the previous crop adjusted to reflect any increases in the cost of production (excluding any change in the cost of land). Support for additionals will be determined by the Secretary taking into account various marketing factors, ensuring that no CCC losses occur. CCC will typically realize losses on quota peanuts placed in loan unless quota supplies are short or there are substantial profits made from the resale of additionals. Program costs can vary from year to year, largely reflecting the impact of weather on the size and quality of the crop, and quota size and loan rates. Net losses for the program averaged \$16 million annually for fiscal years 1986-94. However, with the minimum quota substantially higher than market demand, losses are projected to average \$84 million annually for fiscal years 1995-2000.

The future of the U.S. food demand for peanuts is contingent upon the ability of the industry to effectively deal with declining consumer demand for peanuts, which many attribute to the concern over diet. Introduction of nutritionally altered peanut products may allay many consumers' concerns about diet which advertising and education can assist. For this paper, domestic food use is projected to remain essentially flat over the next several years. Although crop yields will likely average a little below last year's high level, peanut production may stay between 3.9 and 4.0 billion pounds. Exports and crush are expected to decline slightly from the 1994/95 level.

At Stake

Tobacco policy has been authorized in permanent legislation and is not subject to reauthorization in the 1995 Farm Bill. Most of the peanut program provisions were extended through the 1997 crop by OBRA-93. However, several groups within the two industries have discussed possible courses of action and program changes in the upcoming 1995 Farm Bill. Virtually all major provisions of the peanut program are being discussed including minimum quota, undermarketings, lease and transfer, quota support formula, area cross compliance, permitted use of additional peanuts, and no-net-cost assessments. Views conflict on whether the Federal Government should administer tobacco and peanut programs that cost taxpayers even small sums or whether current procedures for determining price supports and production levels are appropriate. There is growing concern that both commodities are over-priced in the world market.

Future of the Tobacco and Peanut Programs
USDA Agricultural Outlook Forum, February 23, 1995

A. Blake Brown, Assistant Professor/ Extension Economist
Agricultural and Resource Economics, North Carolina State University

Good Afternoon. I appreciate the opportunity to speak with you today. My extension and research responsibilities at NC State are for policy and farm management for tobacco and peanuts. One thing I can say about the two commodities with which I work, is that there is never a dull moment. The programs for both commodities seem to be under constant scrutiny and this year is no exception. I have been asked to speak today about the future of the tobacco and peanut programs.

Peanuts

First, let me address the peanut program. To say that 1995 will be a pivotal year for peanut policy is an understatement. The 1995 farm bill will likely be the greatest challenge faced yet by proponents of the current peanut program. With 1994 program costs at about \$119 million and the current attitude of congress concerning cutting expenditures on farm programs, the U.S. peanut program will face strong attacks during formation of the 1995 farm bill. Users of U.S. peanuts and peanut producers who do not own quota will lobby for substantial reductions in price support or even elimination of the program. The peanut program, along with sugar, is often targeted in the media as one program in which expenditures must be reduced.

Although program costs have been increasing in recent years, program costs since 1985 have not been large with the exception of two recent years, the 1991 and 1994 marketing years. There are two primary reasons that the current policy has resulted in increasing program costs. First, the current program rules do not allow either the price support or quota to fall with

declining demand. Price support on quota peanuts is a function of production costs and usually goes up regardless of demand. The national quota is set to equal estimated domestic demand, but cannot fall below 1.35 million pounds. Estimated demand for both 1994 and 1995 was below 1.35 million pounds but the program rules did not allow the quota to fall. Secondly, when the quota is set, the program does not allow for consideration of carryover quota. If there is substantial carry over of quota, as in 1991, then the effective quota is large relative to demand. These two shortcomings led to large program costs in 1991 and 1994.

Domestic demand for peanuts may continue to fall because of increased imports of peanuts under GATT and NAFTA and declining U.S. consumption of peanut products. The cap on imports of peanut paste from Canada will help stabilize demand to some extent. Policy makers could eliminate most program costs by changing the program rules to allow quota price or effective quota to decline with demand. Efforts are currently under way to convert the current program to a no-net-cost program, like tobacco. Even so, pressure to lower the cost of peanuts to users may still result in a large reduction in support price or even elimination of the program.

My experience with the political process involved in changing farm programs, albeit limited, indicates that which policy alternative just outlined will be chosen is highly unpredictable. It does seem certain, however, that the peanut program will not emerge unscathed and that government costs and the cost of peanuts to users will be lowered.

Tobacco

After two years of gloom and doom forecasts, U.S. tobacco producers entered 1995 with a surprisingly bright outlook, at least for the short run. The chance of an increase in the federal cigarette tax is slim or nil under the current congress and the chance of increased smoking

regulation has been reduced. World prices have improved as the world glut of tobacco has been reduced. In addition, domestic cigarette manufacturers agreed to purchase large surplus stocks held by the grower cooperatives so that a large quota reduction was avoided. Import restrictions combined with strong cigarette export demand led to increased domestic use in 1994 and subsequent depletion of already low manufacturer stocks. As a result of these factors, the 1995 flue-cured quota increased 16 percent and the burley quota remained about the same as in 1994.

But all is not quite as rosy as it seems. The fundamental problems facing the tobacco industry remain. Anti-smoking sentiment remains high, as indicated by the recent round of lawsuits. A change in political climate could unleash new proposals for increased cigarette taxes and regulations and domestic consumption continues to decline. International competition from other tobacco producing countries such as Brazil remains fierce and world prices, although improved, are low relative to the U.S. price. If manufacturers successfully replenish stocks in 1995, the 1996 flue-cured quota could decline 8 to 15 percent to 800 to 850 million pounds. The 1996 burley quota will likely decline although not drastically. Unmanufactured exports of U.S. tobacco will continue to decline under the current program, with flue-cured exports stabilizing at 300 to 320 million pounds and burley exports stabilizing at around 100 million pounds, at least for the short run.

If U.S. tobacco producers wish to prevent further declines in the national quotas, price may have to be addressed. Reformation of the grading and marketing system would reduce the need for price reductions to maintain the quota. However, improvements in quality or marketing efficiency may not be sufficient to maintain quota levels. If price is allowed to fall, then income to non-producing quota owners will fall. Producers give up return to quota that they own, but earn

additional profits since they produce more tobacco. Whether or not a producer is a net gainer or loser depends on the amount of quota he owns relative to how much he rents. On the other hand, total revenues to tobacco producing areas increase and the long run viability of U.S. tobacco farming is enhanced. Thus, policy makers must clarify their policy goals. Allowing price to fall is good for rural economies, but bad for non-producing quota owners. The aggregate effect of a price reduction on producers is ambiguous, at least in the short run, while in the long run it enhances the viability of their business. Such changes in the tobacco program will require legislative action, something risky in itself.

The U.S. tobacco program is separate from farm bill legislation, however it is not immune from being brought up during the 1995 farm bill. Some legislators have classified the tobacco program as "monopolistic" indicating that it should be eliminated even though the government cost of the no-net-cost program is very small. While such attempts to eliminate the program may be defeated by tobacco state legislators, market forces and pressure within the industry will likely force some kind of changes in the tobacco program in the next few years. At a minimum they will involve improvements in the grading and marketing system. Unless producers are willing to grow less tobacco, it seems likely that policy makers will have to deal with the price reduction question; at least within the next five years. As with peanuts, the process is political, making the outcome very unpredictable. However, change would seem difficult to avoid. Thank you.

FUTURE LEAF TOBACCO TRADE

J. T. Bunn, Executive Vice President
Leaf Tobacco Exporters Association

First, I want to thank Mr. Charles Hatcher and other USDA officials for allowing Leaf Tobacco Exporters Association to be represented at the first Agricultural Outlook Forum. Also, I appreciate USDA's interest in allowing us to express our views on Future Leaf Tobacco Trade.

For most of the century, our industry has operated under the umbrella of The Tobacco Program. For most of those years, the program worked pretty much as it was intended to. Production was controlled, minimum market prices were guaranteed, unsold tobacco went into Stabilization, and we all enjoyed the prosperity that flowed from our supply management. We didn't have to worry about competition or real market conditions outside because we had an artificial market to protect us from the rest of the world and we had a one-of-a-kind product. We had the best of all possible worlds.

Then things started to happen that we couldn't control: Cigarette consumption began to drop here at home. Tobacco growers in other countries began to improve their quality and expand their plantings. While our costs continued to rise, theirs were lower. Manufacturing technologies continued to evolve, enabling cigarette manufacturers to make full-flavored American-blend cigarettes with less and less U.S. tobacco. Our customers at home and abroad began crunching numbers like never before and the pressure to reduce costs became enormous. We noticed these cracks in the foundation, but we didn't really take them very seriously. After all, we were still the best; no one could challenge our quality.

Today, each of us knows that reality has changed. The recent pool stocks bale-out is clear evidence that we still don't allow the real cracks in our broken program to show through. Had we allowed the program to operate as it should, quota would have been cut by 40%. The buy-out saved that from happening--but only by sidestepping reality. And the reality is that the program we've taken for granted for so long can't work when we can't control supply. The program that served us so well in past decades also has insulated us from what's really happening in the world market--yes, the export market. We regularly allow it to be manipulated for political and special-interest reasons. As a result, other countries around the world expand their tobacco production while our output here in the United States shrinks as we continue to control our production. In short, we withdrew from the world tobacco production race.

The numbers tell the story. Since 1964, worldwide flue-cured production has more than tripled. In those 30 years, Brazil's output increased nearly six-fold. Zimbabwe's production rose 25 percent. China's flue-cured output is more than eight times greater than in 1964. Meanwhile, our production here in the United States dropped nearly 35 percent. We are now growing only 9 percent of all the flue-cured tobacco grown in the world!

Is it any wonder, then, that trade patterns have shifted? Unmanufactured flue-cured exports from Brazil, Zimbabwe and China are all substantially larger than they were 30 years ago, while our exports from the United States are smaller by 38 percent.

The world's tobacco pie has grown substantially, but our slice of it has shrunk to a sliver. As a result, we are leaving money on the table. Forty years ago, over half of the flue-cured and burley tobacco moving through the world's export markets came from the United States. Today, our share is closer to 14 percent.

We are capable of producing an ample supply of tobacco--enough to meet the demand here at home and in our overseas markets. But we must face the reality that just because we can grow it does not mean today's buyers will come and buy it. In fact, just the opposite is true. If we have learned anything from the market patterns of recent years, it should be this: Customers will come and buy our tobacco only if we are offering the styles they want at a competitive price for value received. We're no different from the suppliers of any other product when it comes to our need to understand the rules of customer demand in the marketplace.

The blunt truth is that our traditional customers are looking elsewhere for tobacco. And finding it. Our customers here at home have told us, "No more buy-outs. It's time to get your house in order." Our customers overseas have told us, "Improve your efficiency and get your prices back in line with product value or we'll go elsewhere."

Let's not be put off by this question of price. None of our customers--whether here at home or overseas--expect U.S. growers to produce tobacco without a profit. But our customers tell us we must no longer allow production and sales inefficiencies to burden our product with unnecessary costs. Can we seriously disagree with them? Our customers contend we can no longer allow our price support program to function as an artificial price-setting mechanism.

Can we disagree with the fact that our pricing system does not reflect the realities of the marketplace? In fact, our price support system does insulate the producer from the customers' influence, the producer responds to a price that is not market-driven. Consider this example: American flue-cured growers have modified harvesting procedures to accommodate least-cost techniques. Production technology now enables once-over or twice-over harvesting, and our price support system--in combination with the grading system--has adapted to it. Over the years, we have manipulated the system instead of modernizing it, and, as a result, our system does not reflect buyer demand.

I acknowledge that some of these matters are sensitive and emotional issues. But if you want to maintain or increase your quotas, then each issue--no matter how sensitive--must be openly and objectively examined with a determination to eliminate all non-value added costs and to maximize potential for efficiency.

What do our customers really want? Back in September, several of our major overseas customers met with the Fletcher Committee, a small group of the Tobacco Marketing Cost Study Committee, to present their views on U.S. tobacco policy and identify problems they would like corrected. Their comments centered on three main areas: Quality, Supply and Price. Let me summarize for you the key points they made.

- * By and large, our export customers agree that the overall quality of U.S. leaf tobacco is still superior to the tobacco grown in other countries. However, they also contend that the difference is not nearly as great as it used to be. Our customers say they can find acceptable quality tobacco for their blends in other markets where prices are significantly lower.
- * Our customers are concerned about presentation quality. They point to widespread problems of mixed offerings, nested tobacco, lack of uniformity and a considerable increase in foreign matter. They cite poor auction conditions, such as bad lighting and tobacco strewn about the warehouse floor. I cannot think of another product that is so poorly presented to its buyers.
- * Their greatest concern is with price--particularly the impact of no-net-cost fees, quota lease rates, marketing costs, and other charges that add no value to the product they're buying. In their view, the gap between value and price is too wide.
- * Many of our customers view the no-net-cost assessment as an unjust export tax that serves only to subsidize U.S. domestic manufacturers and is tantamount to a penalty for doing business in the United States. They resent this fee, which they report adds 2 to 3 percent to their packed cost of U.S. leaf. British-American Tobacco, for example, says the no-net-cost fee alone cost BAT and its associated companies \$1.8 to \$2.0 million on its purchases of U.S. flue-cured last year--and that does not include domestic purchases made by its U.S. operation, Brown & Williamson.
- * Our customers are concerned about inefficiencies in our marketing system that add unnecessarily to the cost of our tobacco. Their consensus: we have far too many auction warehouses, making the costs of marketing far higher than they need to be.
- * Finally, our customers are distressed over the strong possibility of future quota cuts that will limit the availability to the grade and stalk positions they need.

When we put ourselves in our buyers' shoes and try to understand their concerns, we have to agree they score some points for logic. If you were a customer, would you pay a higher price for U.S. tobacco if you

could find acceptable substitutes elsewhere? Would you pay more for tobacco if you felt you were paying to subsidize quota lease rates, high marketing costs, high assessments, and what you view as wasteful administrative costs? It's not that our customers are not willing to pay premium prices for top quality, it's that they believe they are being asked to buy our tobacco at a price that is (1) based on an artificial price support system and (2) carries additional costs that add no value to the product they are buying.

Having just recapped for you the message delivered by export customers at the September meeting, I would like to remind everyone that approximately 50 percent of flue-cured tobacco is exported as unmanufactured leaf or in cigarettes, blended strips or cut rag. Protecting the export market is the only way for the producer to maintain or increase quota and thereby protect his capital investment.

Whenever customers speak about price, we almost always assume that they are suggesting that we need to receive less for our tobacco. What they mean is that we can find ways to make it cost less. You have witnessed all of the consolidation going on in U.S. businesses including tobacco. U.S. cigarette manufacturers, leaf merchants and your own agricultural suppliers have been forced to consolidate in an effort to stay competitive. Producers must also use research, technology, and economies of scale to increase productivity and to secure margins.

I recommend to you that now is the time to consider and make real changes to the tobacco program rather than merely applying another band-aid. Major surgery is required.

In the short-term, our challenge is more specific: We must address the issue of competitive pricing. Many growers tell me they can consistently produce tobacco for \$1.00 to \$1.10 a pound. When you add to that the costs of assessments, marketing fees and a reasonable charge for return to management and risk, you get a price floor that will provide growers with some protection and allow the marketplace to reflect customer demands and preferences.

Much of our 1995 direction-setting will hinge on the findings and recommendations of the Advisory Committee on Tobacco, that is, in fact, meeting in Washington today. Believe me, our export customers are vigilantly waiting for word on our actions. This committee is examining changes needed in the way our program operates. This group is likely to be oriented toward a short-term solution but I hope they will set a structure for long-term reform. We must adopt changes that will put our house in order and renew our solid edge in a price competitive industry. We have real opportunities to regain share in the world market. Prices are expected to escalate in other major producing countries. Now that our domestic manufacturers have freed us from the problems of inventory overload, we have a unique opportunity that might never present itself again.

Let me give you some idea of the money we can access by increasing our leaf export sales. According to the USDA Economist Robert L. Tarczy, "For every one percent increase in the world market share, flue-cured

producers would gain \$40-50 million in cash receipts, while burley producers would gain \$20-25 million. The only impediment--price relative to quality."

The time for change is upon us. Working together for the good of the industry, we CAN accomplish what we must. We CAN set a new course based on the market realities of the future rather than the ways of the past.

Future Trade In Peanuts

Thomas C. Earley
Senior Vice President
Abel, Daft, Earley & Ward International

If this was ever a topic at a previous USDA Outlook conference, I suspect that it was probably about a one-minute presentation. Trade in peanuts or peanut products has historically not been much of an issue except when there was a severe domestic shortage due to a poor crop. It was only in the context of the GATT and NAFTA negotiations that peanut trade began to be a topic of discussion. The future of U.S. peanut trade has in part been determined by the outcomes of those two multilateral agreements. The one remaining variable is what happens to the U.S. price support program for peanuts.

World Peanut Trade

Out of the 17 million metric tons (mmt) of peanuts produced in a normal year, about 10 mmt are crushed for oil, mostly in the countries where the peanuts are produced. The 1.3 mmt of peanuts that enter international trade each year are predominantly shelled and represent a significant percentage of the 7 mmt of peanuts that are available for edible use. The major importers are the European Union and Indonesia. The United States is one of the major exporters, accounting for almost 25 percent of world trade. China, Vietnam, India, and Argentina are the other leading exporters, and these five countries together account for more than 75 percent of world trade volume.

U.S. Peanut Exports

U.S. exports take place at the world price, without any explicit subsidy. Some growers produce only for the export market because they do not have domestic quotas. However, for most growers, the price support program probably underwrites exports to some degree.

The United States has been a consistent and generally reliable peanut exporter. Year-to-year variability in supply and demand here and abroad causes exports to vary in a 600-1,000 mil. lb. range (farmer stock basis). The average level is about 800 mil. lbs., and there is no compelling reason why that should change much over the balance of the decade.

U.S. Peanut Imports

Imports have been negligible in the past due to the virtual ban imposed in 1953 under section 22 authority (and under comparable restrictions in place in the 1940s and early 1950s). The only exceptions were the temporary increase in the import quota in response to the 1983 and 1990 droughts. As a result of concessions made in the Uruguay Round, imports this season are expected to jump sharply and approach the new access level of 113 mil. lbs. (farmer stock basis). That will increase to 189 mil. lbs. over the next six years.

Peanut Butter Trade

While peanut butter is a uniquely American product, exports are slowly but steadily increasing, either because its virtues are becoming better understood in other countries, or because there are more Americans (or Americanized foreigners) living abroad. Exports this year are estimated at 28 mil. lbs., or about 40 mil. lbs. on a farmer stock basis. Since there is a mechanism, albeit an imperfect one, for using additionals rather than quota peanuts for these exports, one would expect continued modest growth in the future.

Imports of peanut butter and paste rose sharply in recent years for two main reasons. First, the cost of peanuts in the United States rose as the support level continued to creep up. Second, the phaseout of tariffs between Canada and the United States under the free trade agreements has reduced the protection that had been something of a constraint.

The U.S. government took advantage of the Uruguay Round to cap those imports at about 20,000 tons, or 64 mil. lbs. on a farmer stock basis. Even so, the United States is likely to remain a net importer of peanut butter as long as domestic peanut prices are maintained well above world levels.

Policy Scenarios

Future exports of peanuts and peanut butter will be about the same as they have been in the past, but future imports will depend heavily on U.S. government farm policy and on developments in the Mexican economy. There are three policy scenarios worth examining in this regard:

- Continuation of current policy, with a loan rate freeze.
- Partial reform, e.g a one-third loan rate reduction and greater flexibility.
- Elimination of the program.

Under any of these scenarios, U.S. import rules stay the same unless changed via legislation. In contrast to sugar, where there is explicit authority for the Secretary of Agriculture to increase import quotas if he thinks it necessary, the tariff rate quotas for peanuts are fixed.

With elimination of the peanut program, imports of peanuts and peanut butter would fall to near zero because U.S. buyers could obtain domestic supplies at a price comparable to the world price. The United States would continue to produce an exportable surplus, and we would go from a two-price market to a market with a unitary price.

At the other extreme, continuation of current policy will eventually stimulate export-oriented production in Mexico. In recent years, Mexico has actually been importing increased quantities of (world-priced) shelled peanuts from the United States, but the recent devaluation will set that process back considerably. While Mexico imported about 18,000 metric tons from the United States in 1994, the volume is expected to decline sharply in 1995.

There is every reason to believe that a Farm Bill that locks in the current program for another five years will encourage Mexican farmers and processors to gear up to export peanut butter to the United States, since Mexico is not subject to any quotas on that product. Longer term, the phaseout of the prohibitive second tier tariff would permit Mexico to also export shelled peanuts to the United States, but the degree to which that will develop by 2000/01 will hinge heavily on exchange rates. My guess, and it is only a guess, is that imports of peanut butter from Mexico could approach 15,000 tons by the end of the decade with a continuation of current U.S. policy. Imports of peanuts could be a couple of thousand tons above the first tier allowance of 4,000 tons or so, and headed higher. It is important to remember that after 15 years there will be no duty on peanut imports from Mexico.

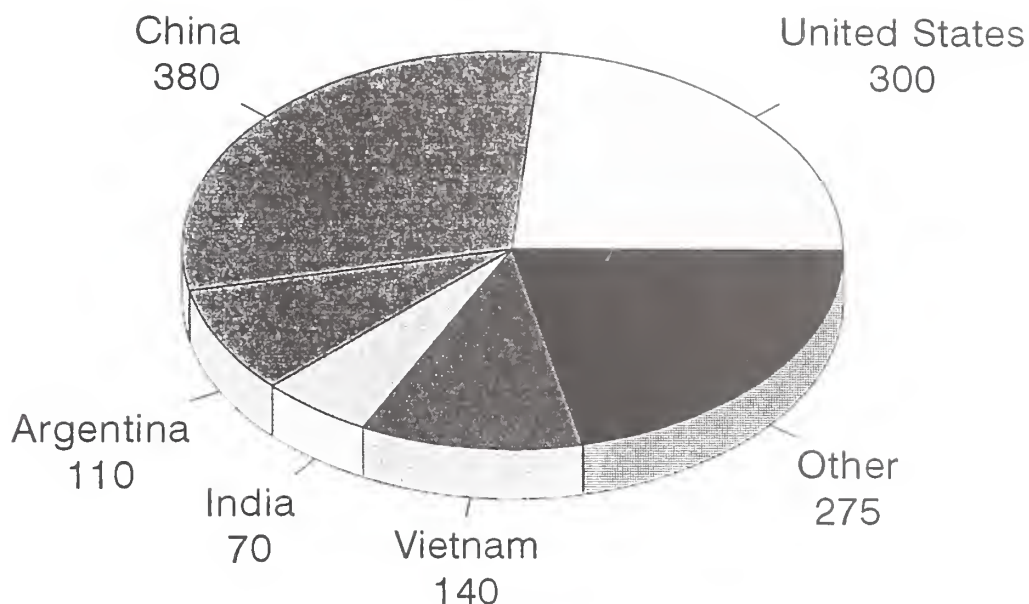
A one-third reduction in the U.S. support level would still leave U.S. prices at a premium to world market levels, but not enough of one to stimulate export oriented production in Mexico. I would expect no imports from Mexico of either peanuts or peanut butter under that scenario, but imports from traditional sources would continue at the permitted levels.

The bottom line is that even with a continuation of the disgraceful policy now in place, imports of peanuts and peanut products remain modest over the next few years due to prohibitive second tier duties. However, current policy will become nonviable after the turn of the century as duties on Mexico are phased out. If trade liberalization were to bring a country like Argentina into the free trade area, the crisis for the peanut program would come sooner.

In reality, there is no reason at all for the United States to be a peanut importer. Its favorable climate and low production costs make U.S. growers competitive in the world market and will keep the United States in the first rank of peanut exporters even without a government support program.

World Peanut Exports: 1994/95

(1,000 mt, shelled basis)

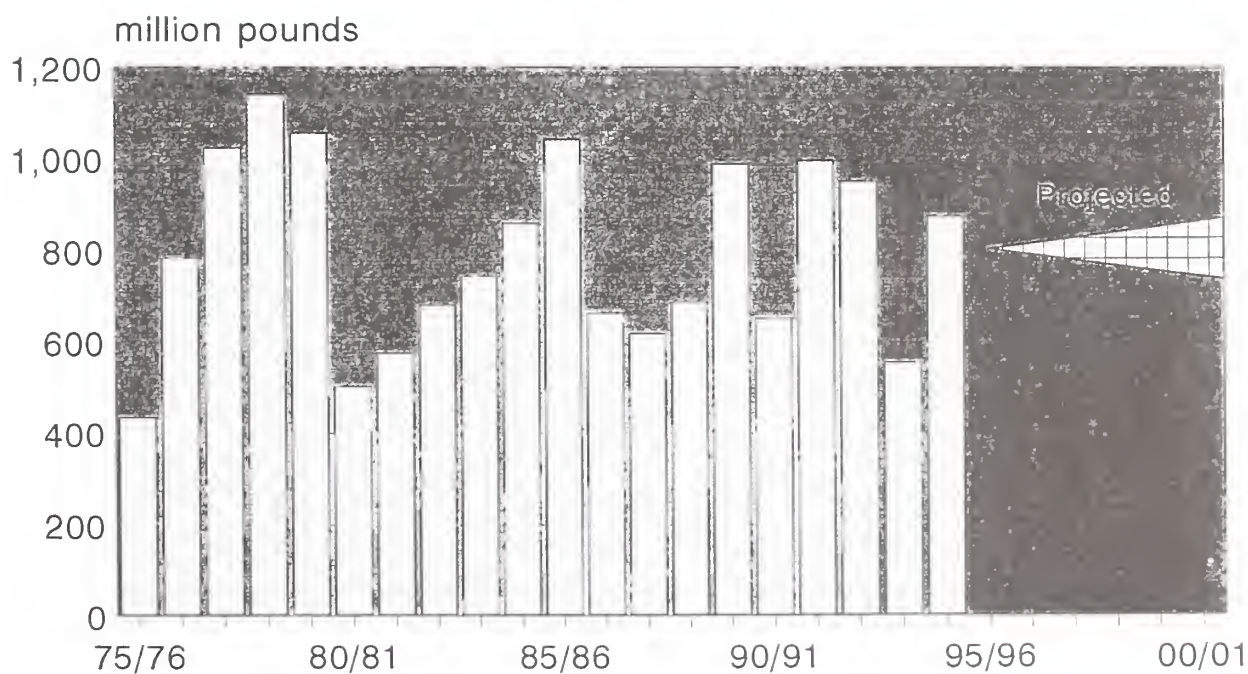


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Source: Oil World

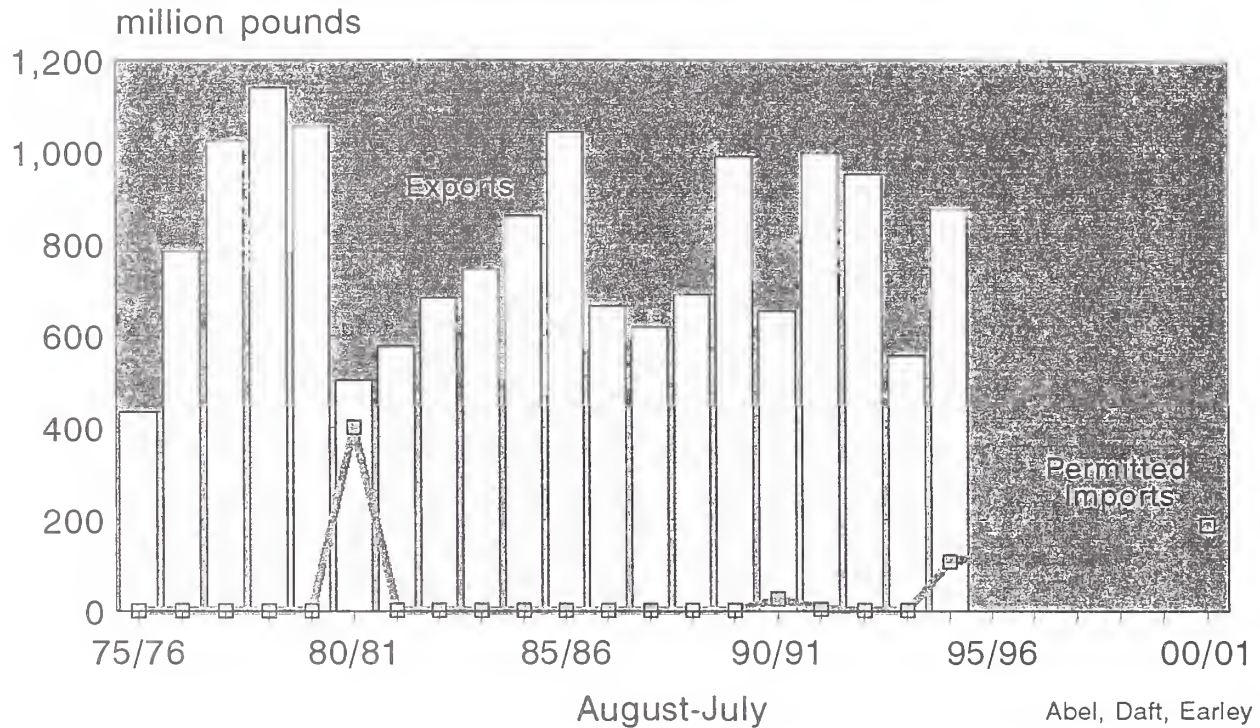
U.S. Peanut Exports

(farmer stock basis)

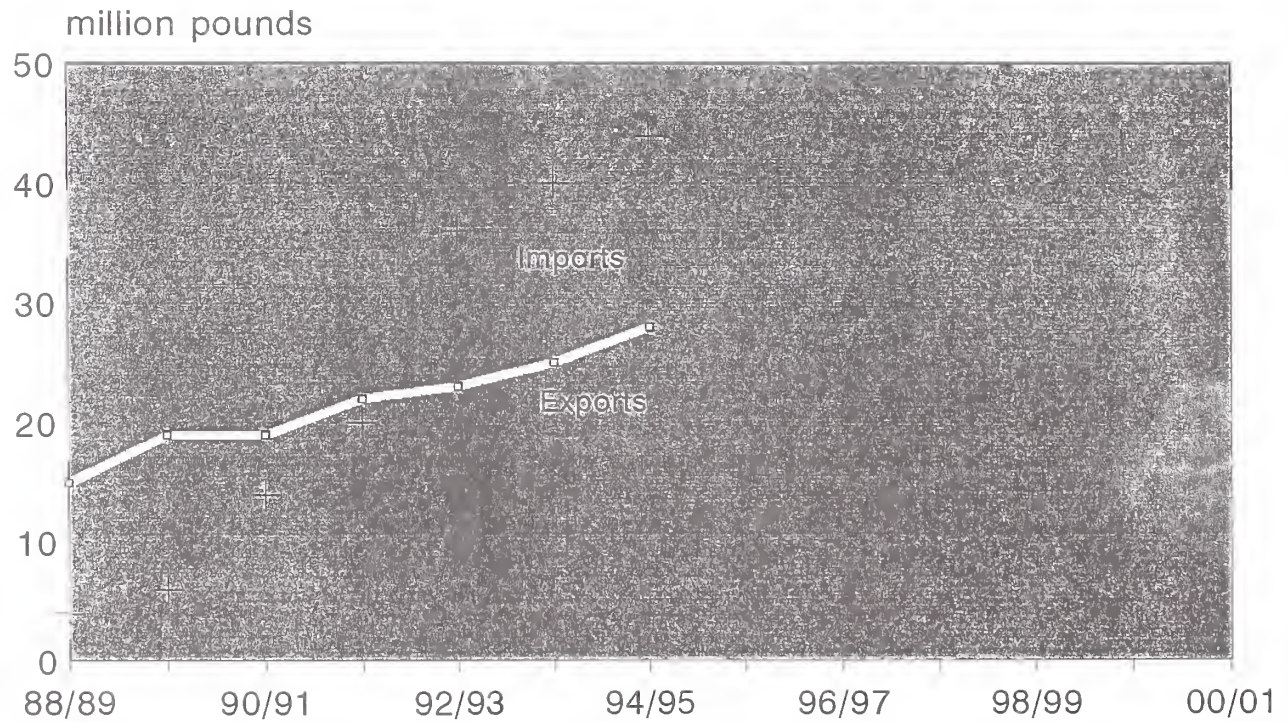


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U.S. Peanut Imports (farmer stock basis)



U.S. Peanut Butter Trade



Policy Scenarios Affect Imports But Not Exports

- Continue current policy, with frozen loan rate
- Cut loan rate by one-third, and increase flexibility
- Eliminate program altogether

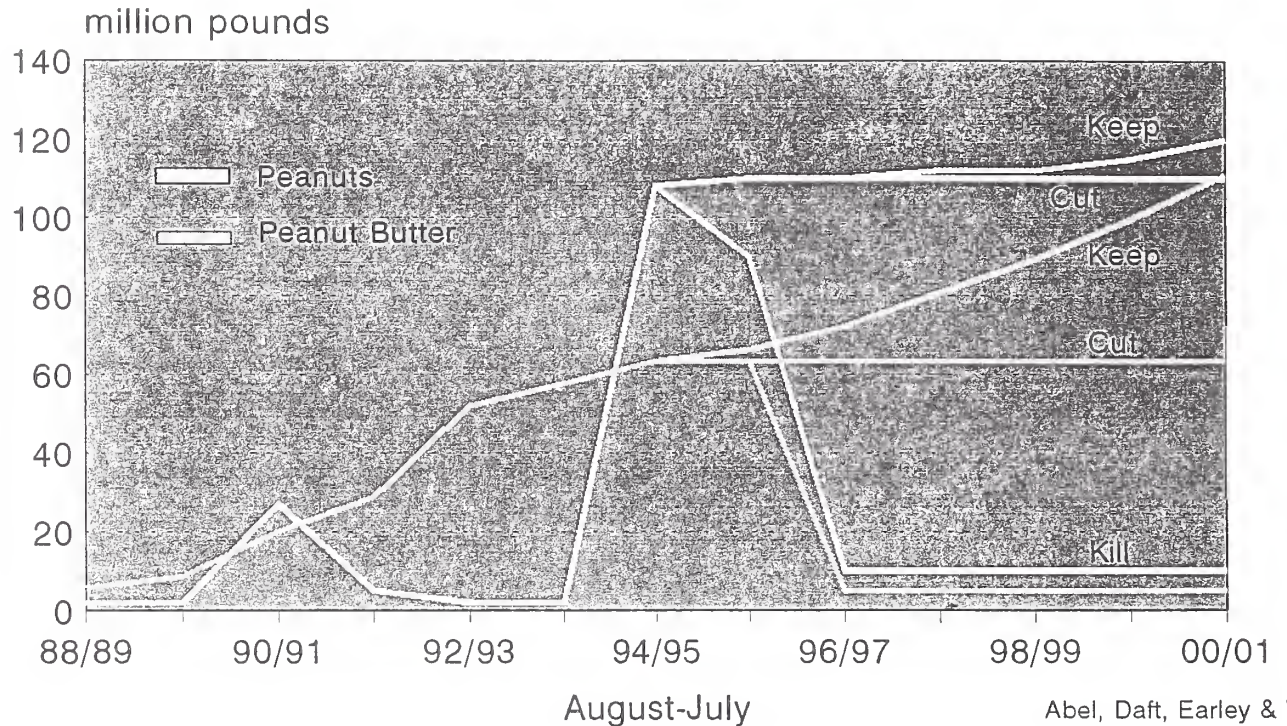
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Mexico Is The Only Variable Other Than U.S. Policy

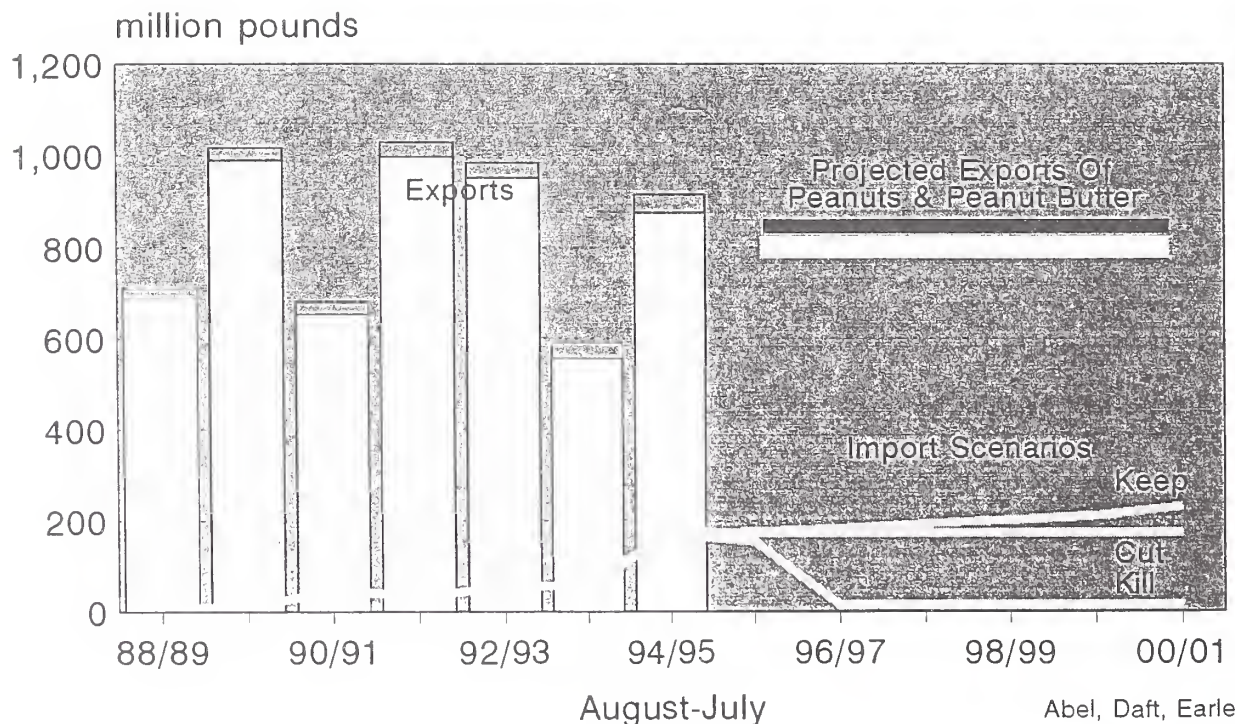
- The United States has been exporting peanuts to Mexico
- Mexico's short term export opportunity is in peanut butter
- Mexico's long term opportunity is shelled peanuts, as declining tariff provides access

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U.S. Import Possibilities (farmer stock basis)



Future Peanut Trade: The Bottom Line (farmer stock basis)



PROSPECTS FOR DOMESTIC CONSUMPTION AND EXPORTS OF CIGARETTES

Larry Sykes
Director of Agricultural Programs, Philip Morris USA

Thank you very much for the opportunity to be with you today and discuss the consumption outlook for domestic and U.S. export cigarettes. First, I would like to look at the domestic market, and then turn our attention to U.S. cigarette exports.

U.S. Cigarette Market

One of the more defining moments in the recent U.S. cigarette market was April 2, 1993, which has become known as "Marlboro Friday." At that time, Philip Morris effectively reduced the price of its Marlboro brand by 40 cents per pack.

In August of 1993, this retail price reduction was converted to a 40 cents per pack reduction in the list price with the price reduction being applied to all of our premium cigarette brands.

At the end of 1994, the discount sector had declined to around 31 percent from its high of around 39 percent, with the premium sector accounting for 69 percent by year end.

As premium brands typically include greater amounts of U.S. grown tobacco than the blends of the discount cigarettes, this is undoubtedly good news for the U.S. tobacco producer.

Total domestic industry consumption continues a trend which began in 1982 of declining annually around two to two and one-half percent. While annual decline rates will vary from year to year, the long term trend continues at the two to two and one-half percent rate.

For 1994, the U.S. market consumption is estimated at 483 billion cigarettes. The many market factors which have impacted cigarette consumption in recent years will continue to have a major influence on future consumption levels. The retail price as influenced by federal, state and local taxes, as well as wholesale prices, will certainly be a factor.

Despite the political changes brought about by the 1994 election, the excise tax issue remains with us and will continue to command our attention.

At the state level, excise taxes continue to increase on a yearly basis with the current sales weighted excise tax at 31.3 cents per pack of 20.

Other issues such as smoking restrictions, potential advertising bans and the potential additional regulations being considered by federal agencies obviously can have significant impacts on cigarette consumption.

Even taking into account all of these factors, at around 483 billion cigarettes, the U.S. market remains one of the largest in the world and provides a solid foundation for the U.S. tobacco industry, an industry that generates 680,000 direct jobs and represents an estimated \$54.7 billion in total revenues in 1994.

Export Cigarettes

The export of U.S. manufactured cigarettes continues to play an important role in total U.S. cigarette production. Since the mid '80's, cigarette exports have grown from 64 billion units in 1986 to approximately 225 billion units in 1994. This growth has allowed cigarette production to remain approximately level over the past ten years.

The opportunities for continuing growth in cigarette exports from the U.S. are considerable. Markets in western, central and eastern Europe, in Asia and in South America are strong. Many are growing, and overall, especially when you add in the consideration of China, the opportunities for future growth are very exciting.

Of special significance internationally, is the often little understood fact that we manufacture and market American blend cigarettes. While the American blend is obvious here in the U.S., in other countries, you traditionally find black tobacco cigarettes, English/Virginia styles, or the oriental tobacco types, along with other varieties of cigarettes.

Of the entire world market estimated to be about 5.5 trillion cigarettes, only about one-third is American blend. Thus, while the total world market is growing around one percent or slightly less, the growth in American blend cigarettes is around 3 percent per year. So, I think you can understand the significant opportunity that exists for growth of U.S. manufactured cigarettes.

While the opportunity is there, competition for this growth will be especially keen. In addition to multinational tobacco companies that have operations based in the U.S., there will be other significant competitors such as B.A.T., J.T.I. and Rothmans.

The companies that will be most successful will be those that offer the best value to the consumers -- that combination of quality and price that makes the consumer feel that he is getting what he pays for. This competition will continue to put price pressure on world leaf markets including here in the U.S.

As markets in Central and Eastern Europe and Russia develop, there will be pressures to manufacture some of the brands for the marketplace locally. Thus, the greater long term opportunity for U.S. manufacturers will likely be in the export of American heritage brands such as Marlboro, which are in the premium categories in many of these markets.

Future opportunities for the American heritage brands will depend not only on the improving economies of these markets, but also on market access. We are all aware of the success the U.S. cigarette exports have enjoyed with market access in places such as Japan. Access to other markets, especially the growing market in China, will have a significant impact on future growth of U.S. exports.

As U.S. cigarette exports grow in markets with developing economies, we can expect increased volatility in the volume of exports. Recent export history reflects this fact with cigarette exports at 179 billion in 1991; 205 billion in 1992; 195 billion in 1993; and 225 billion in 1994.

As U.S. exports penetrate markets such as central Europe and Russia, market conditions will lead to increased variation in U.S. shipments. The demand for our products in these markets is there. What is often lacking is the ability to make the purchase.

1994 is an excellent example for Philip Morris. In the last half of the year, we experienced a significant growth in exports to central Europe and Russia, which were unanticipated earlier in the year. Experience has shown that these exports can disappear just as unexpectedly. Thus, the level of exports can show considerable variation from year to year.

At the level of 1994, cigarette exports are certainly a major factor in the U.S. industry, representing about one-third of total production and translating into thousands of U.S. jobs.

Leaf exports and manufactured product exports together contributed over \$6 billion to our balance of trade last year.

All these factors point to the important role that cigarette exports will continue to play in the U.S. industry and the opportunity they represent for growth both for manufacturers and tobacco growers.

Summary

To briefly summarize, domestically we can expect continuing decline in our market while the size of the U.S. market continues to provide a solid foundation for the U.S. industry. The rate of decline will depend on numerous factors that impact on where people can smoke and the cost of tobacco products.

For cigarette exports, there is tremendous continued growth potential. It is anticipated that the volume of U.S. exports will show more volatility than in recent years, and the competition for cigarette exports in available markets in central Europe and Russia will be very keen among the multinational cigarette companies.

The growing popularity of American blend cigarettes enhances the opportunity for U.S. exports, especially those brands with an American heritage.

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Peanut Consumption
At a Crossroads

Jeff Johnson

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Suffolk, Virginia

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SHELLERS
PEANUT OIL
PEANUT MEAL
PEANUT HULLS
CERTIFIED SEED
EXPORTS

My brief is to talk about consumption of U.S. peanuts. Usually when I give a talk I start with the good news first. Unfortunately there hasn't been much good news lately so I'll just jump right in with the bad news. (Chart 1) Here is a graph of peanut usage in the U.S. from 1989 to the present based on the Stocks and Processing Report. For 1993, usage was down 11.00% from the peak year of 1989. I've done it on a quarterly basis and you can see it is a steady decline. If it continues at this rate consumption for 1994 will be down almost 14% in the 5 years since 1989.

This looks pretty straightforward, but it's a political year so all kinds of things are being done with statistics. For example we've heard some groups say that consumption is actually up slightly since 1984. You can see from this overhead that (Chart 2) it's technically true but it's certainly disingenous. It proves Disraeli's statement that there are 3 kinds of lies - "lies, damn lies, and statistics."

Actually, consumption is even worse than it appears in the first chart. Stocks and Processing is a production report. In the last 5 years there has been a substantial increase in the amount of peanut products produced in the U.S. and exported. These products show up in the report just as if they were consumed in the U.S. We estimate that 54,000,000 lbs. of peanuts are exported in products each year. This is up from about 20,000,000 lbs. in 1989 and if you factor that in consumption is really off 16%. All of you know that GATT and NAFTA legislates imports of 33,000 mt of kernels increasing to 55,000 mt by the year 2,000 and that will come directly out of U.S. consumption.

I do a lot of statistics and I know we tend to look at things in the abstract, but this has already caused real economic pain. In the last few years 4 peanut butter manufacturers have simply closed their doors - Bama, Roddenbery, Torbitt, and Koeze no longer exist. This decline is costing jobs and unless there are significant changes made in the program this is only the beginning.

There is some controversy over what's causing the decline. I believe the consumer emphasis on "low fat" has had some impact,

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but the manufacturers will tell you that the main reason for the decline is price. They say that once peanut butter retails for approx. \$2.00 a jar, for example, consumers find cheaper alternatives.

Also, manufacturers claim that they've had to absorb higher peanut prices recently. That has shrunk their margins and consequently they have been forced to reduce spending on promotion and advertising. The industry can't rely on growers to promote peanuts because quota holders have a guaranteed market in the U.S. Government. Quota holders spend relatively little on promotion compared to other commodities because they have no incentive to do so.

How much of the consumption decline is due to price? I don't know. In my experience every significant increase in raw peanut prices has caused a sharp drop in consumption and it's logical to assume a major drop in prices would cause a corresponding increase in consumption. You can argue this whole issue for days and never reach a consensus.

There is another area however, where price is definitely going to be the sole cause of a major decline in U.S. peanut consumption - Imports of peanut products. There has been some talk of peanut butter and candy coming into this country because of NAFTA and GATT. NAFTA and GATT didn't open up peanut product imports into this country. Peanut butter and confectionery imports have been allowed in unlimited quantities since the Agricultural Adjustment Act of 1953. In fact GATT and NAFTA limited peanut butter imports except for Mexico. Peanut Butter and Confections make up 75% of our market and imports have been legal for over 40 years. The reason these products weren't imported is because the price difference between domestic and export peanuts was too close to justify it economically. In fact, U.S. domestic peanuts

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traded at or near world market prices until the law was changed in 1977. (Chart 3) Since then peanuts sold for domestic use have risen in price by legislative mandate while peanuts for export have followed the market. The result, as we all know, is that U.S. shellers are forced to pay about double the world market price for quota peanuts. It's important to note that these "cheap" world market prices aren't limited to third world farmers in poor countries. There are plenty of farmers in the United States who have little or no quota and who grow peanuts for export at world prices. The only difference in cost between growing quota and additional peanuts is the cost of the "quota" itself. Currently "quota" rents for about \$240 per ton in Georgia. Keep in mind this doesn't usually include land. It is simply the cost for the "license" to grow peanuts for U.S. consumption.

The huge difference between domestic and export prices has already caused all sorts of distortions in the marketplace. For example, some manufacturers are importing candy made from foreign peanuts into the United States and exporting U.S. made candy made from additional peanuts. Thus insuring their peanuts are priced at the world market. Something is dreadfully wrong when manufacturers have to resort to that kind of expense to get around inefficiencies in the program.

Peanut Butter Imports were increasing at an exponential rate until GATT capped imports. Now the only country that can import peanut butter in unlimited quantities is Mexico. Can Mexico compete? Sure - If we subsidize them by keeping the quota price artificially high.

Mexican farmer's stock sold last year at \$450 to 500 per metric ton. That was before the devaluation. Mexico can produce good quality peanuts. They use U.S. runner seed and the peanuts are almost all grown on irrigated land. In fact some Mexican farmer's stock is

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being shelled now in Texas and I'm told the quality is excellent. What Mexico lacks is modern drying and shelling equipment so the quality of Mexican shelled peanuts is nowhere close to ours. In fact we export quite a few peanuts to Mexico because they can't compete with us on a free market basis. I was down there several months ago and I think they had 18 drying wagons in the whole country and no modern shelling plants.

BUT- Shelling and Peanut Butter Plants are not exactly Star-Wars technology. Major processors are waiting to see how the new peanut program stacks up. Plans are on the drawing board and if the U.S. continues to support domestic prices at artificially high prices there will be shelling, candy, and peanut butter plants in Mexico in short order. Nobody wants to build a plant in Mexico, but if we legislate \$200 + per ton price difference between Mexican and U.S. peanuts they will be forced to. The volumes will be bigger than people think. Just look at what peanut butter imports did before Canadian imports were capped. (Chart 4). Once these plants are built, they won't go away.

We saw this happen in Japan a few years ago. The Japanese used to rely on domestically grown peanuts and tightly controlled raw peanut imports, both of which were supported at artificially high prices. Unfortunately, another law allowed open imports of processed peanut products into Japan. To get around the controlled price of raw peanuts, Japanese manufacturers built factories in China and began shipping processed product to Japan. I made a couple of trips to Japan with Phil Mackie, who's now an Asst. Adm. at FAS. We warned the Japanese that they were ruining their own market. Unfortunately the farmers and raw peanut importers were addicted to the high prices they were getting. They refused to change until it was too late. Today processed peanut products from China account for 60 % of the Japanese peanut market, and the factories and jobs that existed in Japan have moved to China permanently.

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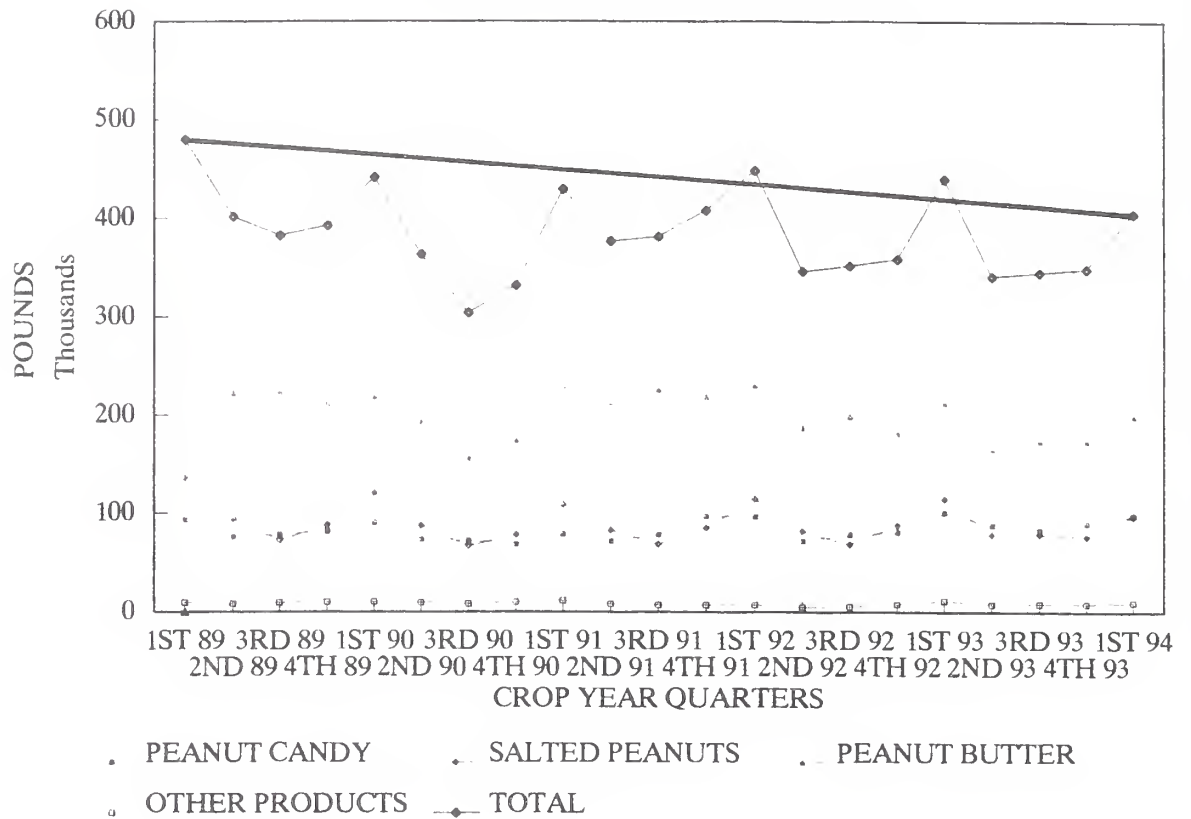
The conclusion is inescapable. You can't sell a commodity at double the world market price and allow imports of the cheaper product into your marketplace. It simply can't work.

If you try it, and realize your mistake several years down the road, it may be impossible to correct. Once we've taught these countries how to grow and process peanuts for our market they won't go away. The production, shelling, and manufacturing infrastructure will be in place and it will be used. We need meaningful reform now.

The terrible irony is, U.S. peanuts are recognized everywhere as the world's best. They are preferred around the world and our farmers have been competing in world markets for many years. If we don't allow them to compete in the U.S. market because of shortsighted legislative policy, then we will destroy an industry of growers, shellers, and manufacturers, that has been a part of our nation's agribusiness since the turn of the century.

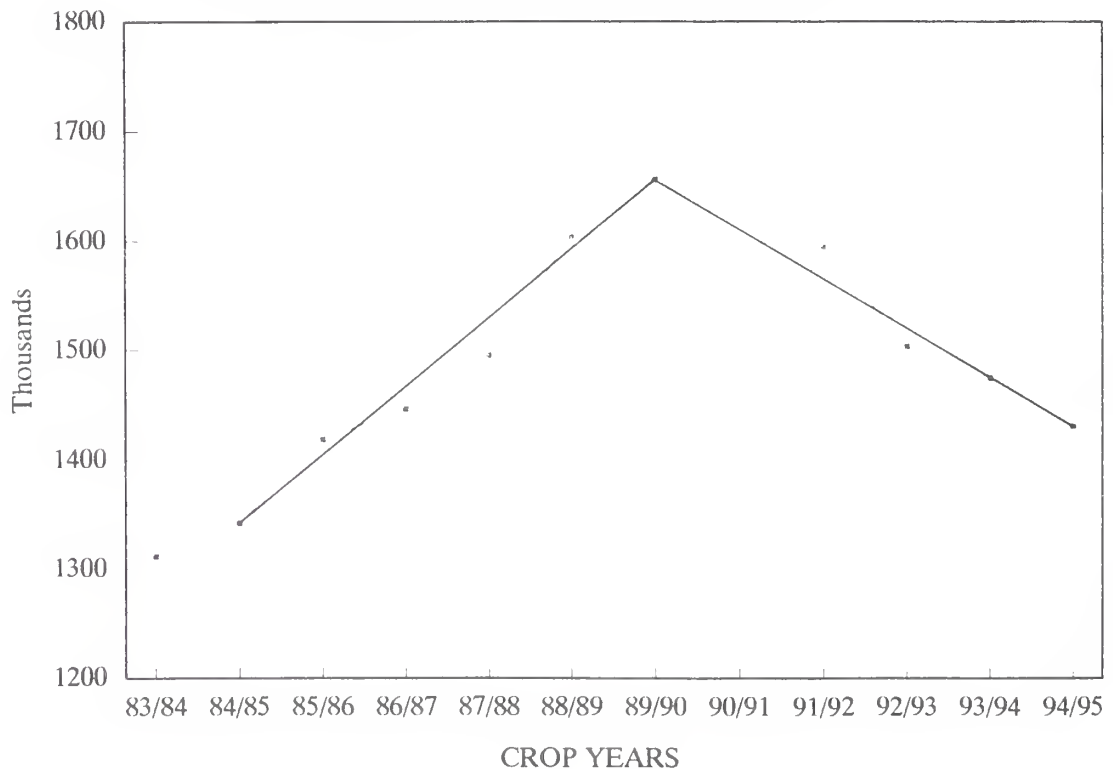
ALL TYPES OF SHELLED PEANUTS

USED IN PRIMARY PRODUCTS

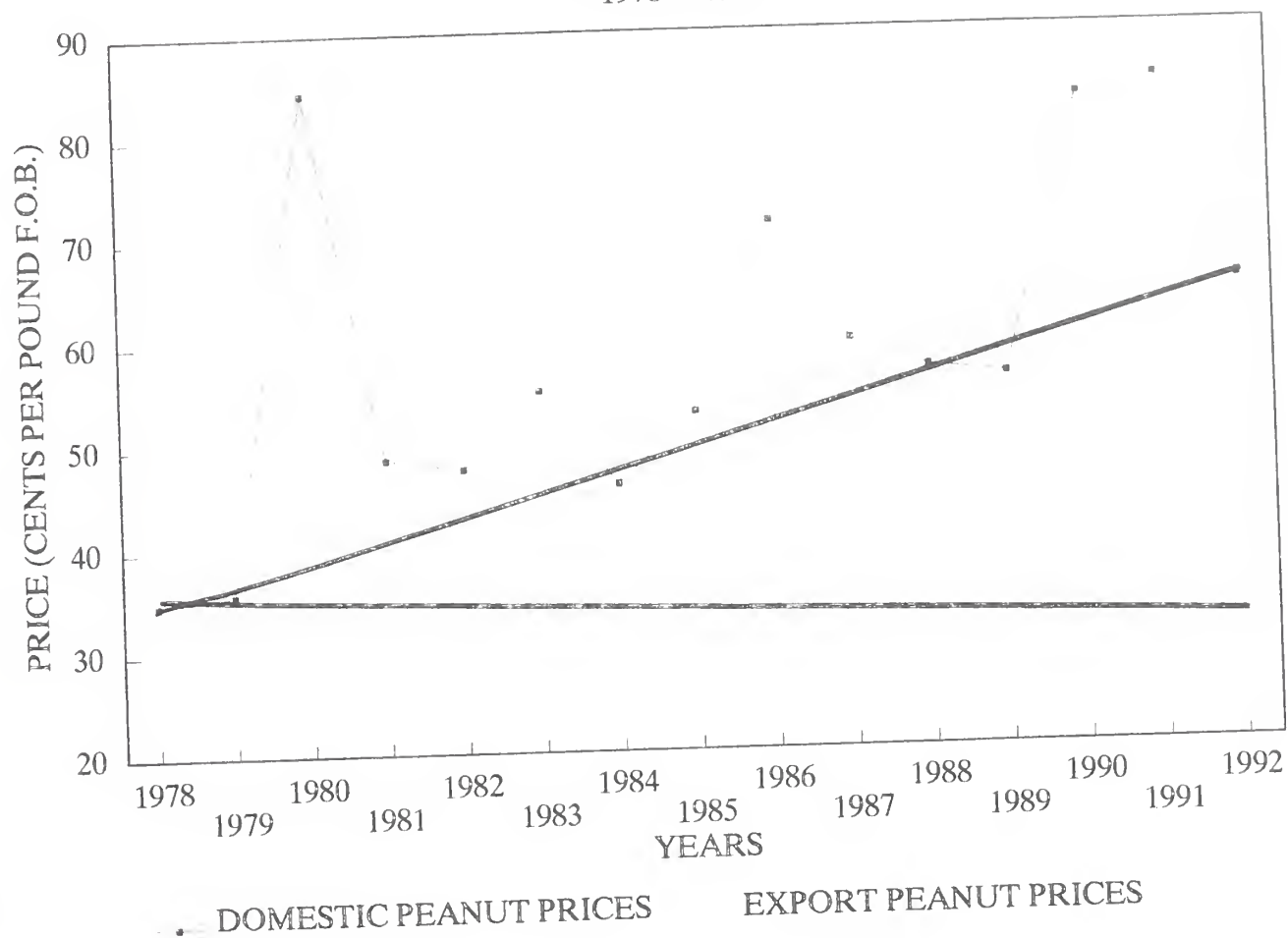


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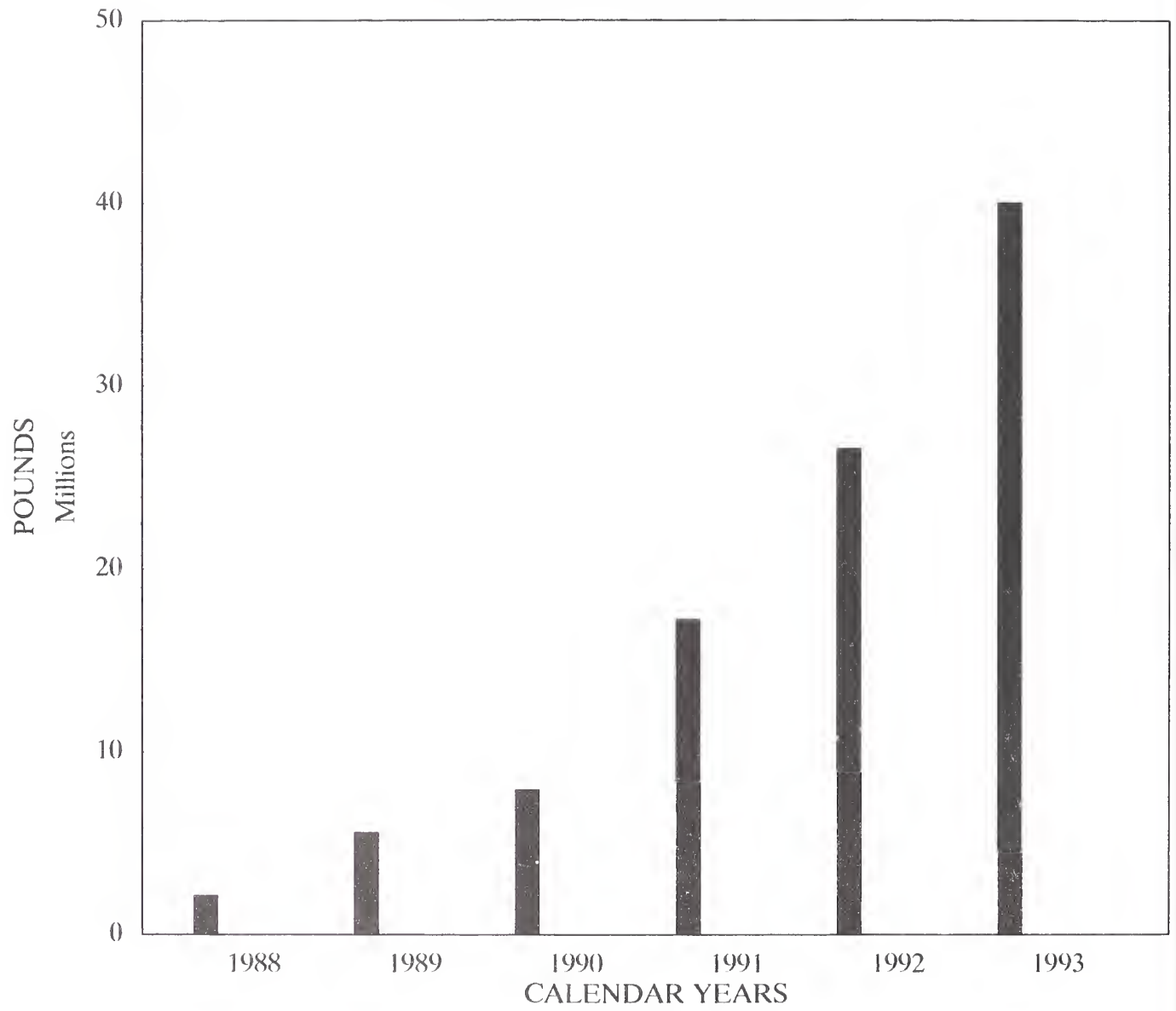
USED IN PRIMARY PRODUCTS



HISTORY OF RUNNER MEDIUM PEANUT PRICES 1978 - 1992



PEANUT BUTTER/PASTE IMPORTS INTO THE U.S.
STATISTICS FROM USDA/FAS



NEW USES: TWO IMPEDIMENTS — UNLIMITED POTENTIAL

Jonathan Harsch
Contributing Editor, *Farm Futures*

Timeframe — timeframe is everything.

Read Peter Drucker, Tom Peters. The typical corporate mentality still doesn't read, listen or learn. It's bottom line. . . . next quarter. . . . you have 12 minutes to clear out your desk. . . .

For anyone caught up in the corporate timeframe, new industrial uses of agricultural commodities is an alternative that lacks immediate appeal — because it doesn't look like an immediate career enhancer. That's why it's still a minority working hard to develop new uses — why the majority of corporate behemoths don't get it — and why a few forward-looking corporate leaders, such as some of the major oil companies, *are* investing in new uses.

Those of us with children calculate college costs 20 years out. Those of us concerned with the legacy we pass along to future generations, those of us determined to reverse the global tide of environmental damage, those of us writing books or government programs, those of us who take the time to attend new uses meetings care deeply about 10 and 20 and even 100 years into the future.

The question for this USDA Ag Outlook Forum is a critical one: What can the permanent minority of people with a long-term perspective do to make new industrial uses happen as quickly and efficiently as possible? How can we help the world benefit from the economic and environmental gains offered by a massive switch in purchasing habits — a global switch to biobased renewable, recyclable products in place of non-renewable, environmentally harmful products?

'95 Farm Bill

It is very possible that the 1995 Farm Bill offers an unbeatable one-time opportunity to take the fledgling new uses movement and send it soaring into flight.

Conventional wisdom — and congressional inertia — tell us that the '95 Farm Bill will be a clone of past bills, simply whittled down 20 percent by the budget hawks. Nothing new. No major changes. Nothing to seriously disrupt the status quo or undermine the established centers of power inside government and inside private industry. The pie gets smaller — but everyone getting a slice today will go on getting a slice, only a bit less filling.

Yet there may be a far brighter vision for U.S. farm policy — a vision of a farm sector that thrives through delivering new nationwide benefits: the benefits of constantly improving the nation's

environmental and economic performance. This vision includes a pie that gets bigger and better for everyone.

Timeframe is the first factor. Think long-term. Think of the five-year '95 Farm Bill as setting the stage not only for the next five years, but for the next 10, 50 and 100 years.

Short term, it makes little economic sense to invest in developing future industrial uses for agricultural commodities. Longer term, there no alternative. It's just a question of how many more years we delay before making the obvious improvements to our agricultural marketing, processing and production systems so that agriculture can assume its natural leading role in a renewable-resource-based economy.

The Farming Business

Another key factor affecting the progress of new uses may be farmers themselves.

Thousands of American farmers today are astute business owners, making sound investment decisions based on solid, bankable, long-term business plans. Yet talk to these farmers. Many of those I talk to think of themselves as business leaders — which they are — and no longer think of themselves as farmers. They separate themselves from the traditional image of the farmer.

Perhaps one necessary shift is for the nation's dwindling minority of farmers to see themselves as in a business like any other business — a business that must constantly adapt and improve in order to survive. It is likely that until the farm sector as a whole becomes more businesslike and creates a new "farmers-mean-business" public image, it will be difficult for non-ag private industry to work more closely with the farm sector and switch over to purchasing the bulk of its raw materials from agriculture.

There are sound economic reasons for farmers to make the switch. Two inescapable facts are that the human stomach can only hold a limited amount of food — and the human body can only carry a limited amount of clothing. As long as the U.S. farm sector relies on providing food, feed and fiber as its predominant source of income, this income will be limited and farmers will continue to fight for government support. Export markets will never offer a long-term solution since foreign stomachs are just as inelastic as domestic stomachs. It is a non-story today to have the "basket-case" countries of a decade ago become food exporters as their economies improve and their population growth slows.

Because long-term world demand for food, feed and fiber is limited, the U.S. farm sector should not expect to prosper unless it successfully develops new non-food markets. Until major new markets are created, farmers will struggle. New industrial uses promises to become a constantly expanding market. This market already exists on a small scale and it can be expanded quickly.

As one example of the potential for new uses, there is tremendous and growing demand for plastics. Biobased plastics already commercially available offer significant performance improvements as well as environmental benefits. Yet for the well-established plastics industry to switch over to using seed oils as its primary feedstock, the industry must have full confidence that there will be reliable sources of supply at competitive prices. Without regard to environmental benefits, private industry must be assured of economic advantages from making even a partial switch to biobased raw materials.

Farm/Non-Farm Partnership Needed

Corporate America as a whole must think longer term before it will switch from hydrocarbon to agricultural feedstocks. Farmers as a whole must become more businesslike to facilitate this switch. In order to gain a greater share of the potentially lavish rewards from developing new industrial uses for their crops, farmers must be willing to accept more of what every other business accepts — a major share of the risk.

Farmers must understand that they have the opportunity to develop entirely new markets with unique needs that they can satisfy in unique ways. There is a window of opportunity for farmers to become partners with private industry in the truest sense by jointly developing a new biobased products delivery system. Farmers should be equity partners and share in the value-added income — not just be the source of cheap raw materials.

Such changes almost certainly will take place. The only question is how fast. Will the changes come fast enough to prevent further erosion of the farm sector economy? Will the changes come fast enough to prevent further human-health and environmental damage from the continued use of petroleum as the primary fuel and feedstock for American industry?

The '95 Farm Bill could facilitate the necessary changes. It could offer economic incentives to both farmers and private industry to work together in developing new uses for agricultural products.

THE OUTLOOK FOR AGRIBASED INDUSTRIAL AND COMMERCIAL PRODUCTS

Wilda H. Martinez

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National Program Staff, Agricultural Research Service

"Agriculture is the Foundation of Manufacture and Commerce." These words, emblazoned below the shield on the seal of the Department are as meaningful today as they were in 1862.

It is true, the dominant resource base in the 1860s was carbohydrates and, in the 1990s, the dominant resource base remains fossil fuels. There are, however, forces of change--social, political, economic and scientific--that offer significant opportunity to sustain and expand the role of agriculture in manufacture and commerce. Commerce and manufacture not only of food, feed and fiber but industrial products that meet the requirements of emerging markets created by these forces.

Industrial products from agriculture is not a new concept. It emerged in the mid 1930s with the formation of the Chemurgic Council. As the name suggests, it was the visionary interface of the era of chemistry with the economic depression, the need for jobs, and the ability of agriculture to produce a surplus that created the interest. These forces combined to set forth this Department on a mission that created four regional research Centers devoted to the enhanced utilization of agricultural commodities. An initiative that by all estimates has paid for itself many times over in all areas of interest--food, feed, fiber and industrial products.

In foods, this research led to processes for consumer acceptable citrus and fruit juice concentrates; for pollution reduction in peeling of fruit and vegetables, for convenience and shelf-life extension as frozen food, potato flakes and explosion puffed products; and most recently for health in the form of lactaid treatment of milk products for the lactose intolerant, and fat mimics from starch and oat beta-glucans for reduced fat intake.

It must not be overlooked that among manufacturing industries, food processing is first in value of shipments and among the top five, which include electrical and electronic machinery, chemicals, and motor vehicles, in employment and the hundreds of billion dollars of value added. Furthermore, food processing is an important component of the economy of

essentially every state in the union.

For fiber, specifically cotton, there is a similar progression of accomplishment over the past fifty years beginning with the design of new processing equipment through chemical modification of the fiber to enhance properties of wrinkle resistance, weathering, flammability, dying and heat-transfer printing, bacterial resistance, and temperature adaptability. These activities kept cotton fiber a viable participant in the textile market during the age of synthetics, and permitted it to emerge as a renewal force for farm and rural economies once the insect control issue was resolved.

The history of soybeans provides a comprehensive example of the role of research in developing food, feed, industrial products and, most uniquely, of the factors involved in the development of a new crop. Never in the history of the United States or of agriculture has there been a crop that increased in importance as rapidly as the soybean. In a period of little more than forty years--1941 to 1982--soybeans ascended from an insignificant position among several forage crops to become the second most valuable U.S. crop surpassed only by corn.

The driving force in this ascendancy was market pull. Clearly investments in agronomics and breeding prior to 1941 by USDA and the State Agricultural Experiment Stations, and the beneficial niche soybeans found in the crop rotation pattern of the midwest played important roles. But, it was first the greatly increased demand for fats and oils during World War II, and then the postwar exponential growth in poultry production creating a demand for high protein feed ingredients that provided the basis for the nearly quadruple increase in soybean production and processing between 1947 and 1967.

Research based on market feedback was also important to this advance. There were processing problems, oil flavor and stability issues, and bioavailability issues in the meal and protein products to overcome. Resolution of these issues was greatly enhanced by industry interaction. In its infancy, many of the small processors were farmer cooperatives who openly sought the assistance of government researchers. Further, there was a degree of openness and frank exchange between the end-use industries and researchers on research objectives that has since disappeared as the industry matured and consolidated.

Because of low cost and availability, soybean oil was also utilized as a raw material for the development of industrial products. Plasticizers, low temperature and high pressure lubricants, polyamide resins from dimer acids, thermoplastic nylons, high solids and water dispersible coatings are some of the many products produced by chemical modification of soybean and other vegetable oils. Despite the development of these many new uses, domestic use of soybean oil for industrial products has remained essentially constant at about 2 percent of supply since 1960.

Why then are the results of these and other very creative chemical modifications of starch essentially ignored in the industrial marketplace? The answer in some instances has been

technology push rather than market pull. In others, it has been the inertia of the U.S. industry toward capital expenditure for process modification or change. But in most instances, the answer resides in the highly successful competitive position of the petrochemical industry in most of these chemical and material markets.

What then are the forces of change, the mega trends that seem once again to offer the opportunity for agriculture to enter the industrial materials market?

First, and perhaps foremost, is the societal recognition of the finite nature of the earth and its resources. When man was able to set foot on the moon, look back at the bright blue marble called earth and find little in further space exploration to compare, the need to preserve, conserve and recycle was embedded in the psyche of the world. The fact that plants grow and regenerate using sunlight, earth's nutrients, water and carbon dioxide and are the only truly renewable source of materials available to man has refocused attention on agriculture and forestry.

This interest in preservation and recycling has now been formalized in regulation at the State and Federal level and created a renewed opportunity for commercialization of prior research on conversion of plant materials to energy in the form of ethanol through fermentation. Similarly, the utilization of fats and vegetable oils as diesel fuel additives, and as neat sources of biofuels where biodegradability is essential, are examples of market pull that current technology has not fully satisfied in an economic manner.

Environmental and safety regulation has also changed the nature of the materials used in manufacturing. New specifications on reduced weight, increased strength, and elimination of hazardous gases if incinerated must now be met.

The National Materials and Minerals Policy, Research and Development Act of 1980, the Critical Agricultural Materials Act of 1984, the Federal Technology Transfer Act of 1986, the 1990 Farm Bill establishment of Alternative Agricultural Research and Commercialization Center, and the most recent Omnibus Budget Reconciliation Act of 1992 creating Enterprise and Empowerment Zones offer a new set of tools to ensure the opportunity for collaboration and interaction between the manufacturing sector and agriculture. Furthermore, since location of processing operations near the feedstock source can provide economies in transportation costs, many of these collaborations could enhance the viability of rural communities through the creation of jobs and infrastructure.

In addition to these tools, there are several economic factors working synergistically to renew interest in agricultural materials. One is the ever-rising cost of waste disposal and the resultant interest in the use of biodegradable components in manufacturing. Further, it has become clear that during the whole post-World War II period, agricultural crops have significantly declined in cost relative to minerals and fossil fuels, and continue to do so. A third factor is the arrival of the global economy as defined by GATT and NAFTA, and the

need to comply in international markets with environmental and quality assurance regulations as codified in ISO 9000 and Codex.

More stringent environmental regulations in foreign countries may also increase the desirability of exporting the processed product rather than the ingredients. However, the cost of the raw ingredients as affected by production costs, government programs and the global economy remains one of the factors critical to the successful development of biobased industrial products. Achieving the appropriate balance between sustainable agriculture, adequate farmer return, and acceptable cost of raw ingredients is the basic economic and technological challenge in the production of industrial products from agriculture.

Beyond these trends there are the advances in science and technology that support the premise of a new era of biobased industrialization to supplant the era of chemurgy; or perhaps more correctly stated, to build upon the era of chemurgy. Materials are now recognized as more than just the stuff that things are made of, they must perform functions as well. The materials paradigm has shifted from commodity, monolithic and structural materials to specialty-engineered, advanced composites and coatings performing specific functions. This change induces a need to shift from large scale, continuous to small scale, batch processes and the ascendance of chemicals over the prior dominance of metals.

All of which is far from inconsistent with the concept that agriculture and rural communities have a role in the manufacture of industrial materials. For in the chemurgy era much was learned, through fundamental research, of the composition, complexity, properties and functions of the polymeric materials produced by nature. Knowledge not only of the basic starch, protein, lipid and cellulosic components found in traditional crops, but also the composition and properties of new crops having unique lipid structures and complex polymeric constituents. This knowledge, coupled with advances in enzymology, genetics, molecular biology and genetic engineering unfolds an expansive platform for the design and production of advanced materials in the field or in the retort. Materials and processes that meet both performance characteristics and environmental requirements.

But there is a critical disconnect. A disconnect between those who have the need and those who can meet the need. Technology push will be far less successful than a clearly delineated specification from market pull. The Cooperative Research and Development Agreement or CRADA is an excellent tool for documenting a collaborative activity once the connection is made. What remains to be resolved is the mechanism for creating the connection.

Europe and the EC formed ECLAIR, an acronym for European Collaborative Linkage of Agriculture and Industry through Research, with a funded lifetime from 1988 to 1993, to improve the overall liaison between industry and agriculture. The program was primarily concerned with the high technology impact upon the agro-industrial food and nonfood sectors. About half of the 63 million ECU contribution was devoted to projects on biomass utilization, nonfood crops and nonfood uses focused on oils, lignocellulose, carbohydrates and biorefinery

development.

A second and third program called AIR--Agriculture and Agro-Industry--continued the emphasis on nonfood crops and nonfood uses.

A fourth framework program for the period 1994 through 1998 involves four separate activities funded at 1325 million ECU. A decision on the actual share for agro-industrial research had not been made at the time of the 1994 publication. From the description of the nonfood sector objectives it is clear that it is the EC intention to establish a technical basis for the development of a nonfood agricultural industry rather than a melding of existing industrial capability and agriculture. They also suggest that in the long term the main push will have to be political.

Given the differences between the two communities--the EC and the U.S.--and the current emphasis in the U.S. on reduction in government, effective mechanisms, other than political, must be identified to enhance the connection between the manufacturing sector and agriculture. With such a connection, both sectors can exceed even the most optimistic projections.

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Session 19: Future Industrial Uses

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**ETHANOL: A GROWING VALUE-ADDED MARKET
LEADING TO ENERGY, ECONOMIC AND ENVIRONMENTAL SECURITY**

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Since 1979, approximately 4 billion bushels of corn have been used to produce more than 10 billion gallons of high-quality, high-performance fuel ethanol. Thus, for more than 15 years, ethanol has been expanding economic growth in our rural communities; reducing government farm program costs; and, creating highly nutritious food and feed co-products for our agricultural sector and the American consumer. Since it was established in 1981, the Renewable Fuels Association has worked to expand these benefits by expanding the market opportunities for ethanol and ETBE.

Background:

Unlike any other liquid fuel alternative available in the foreseeable future, fuel ethanol is uniquely derived from a wide range of renewable feedstocks. Today, U.S. fuel ethanol production technology utilizes such diverse feedstocks as grain, cheese whey, citrus wastes, and forestry residues. The predominant feedstock used by the domestic industry's production facilities, however, is corn. As such, fuel ethanol represents an already important -- and major -- new domestic "value-added" market for our nation's corn producers. Ethanol's important economic benefits include the following:

- o Ethanol production adds between 5 and 10 cents a bushel to the market price for corn.
- o Jobs are created and local tax bases expand. For each 100,000,000 bushels of corn used to produce ethanol, 2250 NEW rural jobs are created.
- o Ethanol production reduces the national trade deficit by reducing our dependence on imported energy, and by increasing U.S. exports of food and feed by-products such as distillers dried grains, corn oil and gluten feed.

In addition to the immediate impact on our agricultural community, the production of fuel ethanol also represents an already important domestic "value-added" market for our nation's corn

producers. One clear example of this "value-added" market is the creation of high protein food and feed co-products through the conversion of corn to ethanol. It is estimated that each acre of corn (115 bu) produces 288 gallons of ethanol, 1437 pounds of 21% gluten feed, 345 pounds of 60% protein gluten meal, and 173 pounds of corn oil. These products represent a sale of value of some \$500 at current prices and the economic activity associated with that production generates \$4440 in gross output.

The Ethanol Industry Today:

Utilized as an effective tool in reducing auto emissions, over 100 million American motorists drove with ethanol blended fuel in 1994, resulting in a record ethanol marketshare in the 1994 U.S. fuel market. For the first time ever, ethanol use increased to double digits. Ethanol blended fuel sales now represent 10% of all automotive fuels sold in the United States.

1994 brought many opportunities to enhance the role of ethanol in motor fuel markets. This year, ethanol blended fuel accounted for over 35% of fuel used in the Oxygenated Fuels program. With the upcoming Reformulated Gasoline program (RFG), ethanol's use as a blending component in the oxygenate market will be an attractive choice for many refiners in meeting the new oxygen content regulations.

1994 ETHANOL INDUSTRY MARKETPLACE MILESTONES

- o 1.4 billion gallons produced in 1994 - an all-time production high
- o A record 560 million bushels of grain used to produce ethanol in 1994
- o Ethanol-blended fuel represents 10% of U.S. fuel sales
- o Over 2 trillion miles driven on ethanol-blended fuel since 1980
- o Over 5,000 new jobs created due to increased ethanol production
- o Every major oil company now sells ethanol-blended fuel
- o Ethanol-blended fuel used in 35% of the Oxy-Fuel program
- o ETBE produced on a commercial basis
- o Value-added markets -- Exported ethanol byproducts exceeded \$760 million

As a result of the anticipation of new clean air act markets, the domestic ethanol industry continues to experience significant growth. This year, the ethanol industry boosted it's annual production to over 1.4 billion gallons, a new record high. Now produced at 43 plants in 21 different states, ethanol certainly has come a long way from a 1979 production rate of 20 million gallons. Since the Oxygenated Fuels program began in 1992, the ethanol industry has added almost 420 million gallons of production. There are 240 million gallons of new ethanol production under construction, and additional expansion will move forward when ethanol's role in the RFG market is assured.

Ethanol Production Expansion

<u>Company</u>	<u>Location</u>	<u>Capacity</u>	<u>Start-Up</u>
Morris Ag-Energy	Morris, MN	2 mgy	Spring
Heartland Corn Products	Winthrop, MN	10 mgy	March
Cargill	Blair, NE	80 mgy	March
Minnesota Clean Fuels	Dundas, MN	0.4 mgy	Spring
Arkenol	Mulberry, FL	8 mgy	Spring
High Plains	York, NE	20 mgy	Summer
Midwest Grain	Pekin, IL	60 mgy	Summer
Nebraska Energy	Aurora, NE	25 mgy	Fall
CVAC	Benson, MN	15 mpg	Fall
AGP	Hastings, NE	30 mgy	Fall

Ethanol & the Clean Air Act:

On January 1, the Environmental Protection Agency (EPA) began to require reformulated gasolines (RFG) in approximately one third of the nation's motor fuel. Today, the program is widely viewed as a success. Production and distribution of the new fuels has gone smoothly; prices, with limited exceptions, have been as expected; some consumers have registered complaints, but they have been largely related only to the smell or health effects of MTBE; and, most importantly, pollution is decreasing in our cities.

Nevertheless, concerns about the RFG program remain. The National Governors' Association released a report indicating that the "benefits of reformulated gasoline have not been effectively discussed or presented to the public", and that "the unanswered question of health effects of MTBE should ... be addressed with a clean, well defined statement on the part of EPA." Several communities, including 28 counties in Pennsylvania, have opted-out of the program, and many more are considering that option. Bills have been introduced in Congress to repeal elements of the Clean Air Act, including the RFG program. And Congressional hearings are planned to weigh the costs and benefits of RFG.

For its part, the EPA continues to stand behind the RFG program, calling it "the most effective pollution reduction strategy ever." The domestic ethanol industry agrees strongly with EPA. The RFG program is a critically important tool for states to use to meet Clean Air Act emissions standards. But the ethanol industry also recognizes that the public acceptance concerns articulated by the nation's governors and leading to congressional action are not without merit. What is clear from the experience in RFG areas to date is that ethanol and ETBE need to have a meaningful role in the RFG program if it is to enjoy consumer support and achieve the environmental objectives envisioned.

RFG Market Development & Cost

Approximately 37 billion gallons of the nation's gasoline (31%) is now RFG. The overwhelming majority of that RFG is blended with MTBE, the methanol-based chemical produced by the major oil companies. Approximately 5% of RFG is currently being blended with ethanol. Most of this is in Chicago, where ethanol has been used for many years and in as much as 35% of the market. In most areas, however, the RFG market is an MTBE-only market. Moreover, it is possible that when summer RFG is introduced, and refiners must dramatically reduce gasoline volatility, ethanol's market share will be cut even further.

One clear effect of an MTBE-only RFG market is that there is little pressure to reduce oxygenate cost. According to AAA, "the introduction of reformulated gasoline has resulted in a 4.2 cents per gallon increase in affected areas." That is consistent with EPA estimates during consideration of the 1990 amendments when they predicted RFG costs between 3 and 5 cents per gallon. But with MTBE enjoying a virtual monopoly over the oxygenate market, consumer costs are higher than necessary. As noted by Citizen Action, the nation's largest consumer group:

"reliance on a single oxygenate raises serious competitive and consumer issues. Competition between and among fuels and firms keeps prices at reasonable levels. Reducing the number of fuel or fuel component choices or reducing the number of suppliers in any given market will allow some companies to reap excess profits."

"Blending our RFG with ethanol allows us to offer consumers an alternative to MTBE at less cost than our competitors."

Letter to New Jersey Governor Christine Todd Whitman
From Getty Petroleum Corp.

Clearly, the reliance on MTBE as the sole oxygenate in RFG has resulted in higher costs than necessary. The principle reason for the increase in MTBE cost is the skyrocketing cost of methanol. In the past year, methanol prices have jumped from approximately \$0.45 to \$1.55 per gallon. An independent analysis has concluded that increasing the amount of ethanol and ETBE used in RFG would reduce overall RFG costs by 14 to 21 percent.

RFG Fuel Economy

Some have suggested that the use of RFG decreases fuel economy. But such concerns are borne of a general misunderstanding regarding the effect of oxygenates on mileage. The facts conclude that the effect of RFG on fuel economy should not detract from the benefits of the RFG program. Gasoline contains an average of about 115,000 btu per gallon. Winter gasolines, because they are more volatile to aid cold-start, generally have lower energy content while less volatile summer gasolines are heavier (denser) and therefore have a higher energy content. This energy content variation between summer and winter gasoline is such that some consumers may notice lower miles per gallon (mpg) in winter months, regardless of whether RFG is being used.

It is important to note that btu content is not the sole determinant of fuel economy or mpg. Other factors, including some that are not fuel related, such as whether there is snow or ice on the road that reduces traction, also affect fuel economy. In addition, fuel economy performance is highly dependent on vehicle technology. With regard to the effect of oxygenates, Bob Reynolds, author of the auto technician's training manual, Changes in Gasoline, concludes:

Factors that Affect Fuel Economy

Vehicle Technology	Vehicle weight
Climate/temperature	Warm up time
Vehicle state of tune	Engine efficiency
Tire pressure	Road conditions
Driving habits	Fuel olefin content
Idle times	Oxygen content
Fuel distillation	Aerodynamics

"controlled tests have shown that fuel economy changes (with oxygenates) are minimal. Such changes, whether positive or negative, are around 2% on average. This would result in typical variations of 0.5 to 0.6 mpg, a level that is not perceptible by most motorists."

MTBE Health Concerns

One of the most persistent concerns expressed about the RFG program has been the question of MTBE's acute health effects. Numerous media reports have chronicled consumer complaints of headaches, nausea, dizziness and rashes associated with the use of MTBE. EPA has steadfastly maintained that the available data does not conclude that such symptoms are the result of MTBE. According to EPA:

"there is not likely to be a substantial risk of acute health symptoms among healthy members of the public receiving 'typical' acute environmental exposures under temperate conditions (i.e., not subarctic temperatures). ... However, it is possible that there are more sensitive members of the population who would respond."

With regard to cancer effects of MTBE, EPA has stated, "MTBE's worst-case unit risk would be about half that of formaldehyde and 50-fold less that of butadiene. Thus, from an individual chemical viewpoint, MTBE's carcinogenic properties are not that different from those of components already present in traditional gasoline emissions." EPA is currently working on a number of health effects tests of MTBE that should resolve these concerns once and for all.

However the MTBE health concerns are ultimately resolved, it is clear that some consumers will still want, and may need, alternatives to MTBE-blended RFG. At a recent public hearing on the RFG program, a New Jersey state environmental official noted that when he received complaints regarding the odor or potential health effects of MTBE, he directed the caller to find ethanol blends. This official further stated that after referring consumers to ethanol blends, he never received a call-back indicating continuing problems. Unfortunately, it is currently far too difficult for consumers in many RFG areas to locate ethanol-blended RFG. Indeed, in many areas ethanol blends are simply not available. The lack of such an alternative

threatens the continued public support for the RFG program.

In Alaska, where MTBE was essentially banned by the Governor because of consumer complaints, ethanol-blended gasolines are now required. The ethanol program has been quite successful with virtually no consumer complaints, little price impact, and tremendous carbon monoxide reduction. Montana had essentially the same experience a year earlier, wherein MTBE had been banned, replaced with ethanol, and the oxy-fuel program preserved. The bottom line is simply this -- *ethanol is needed in the RFG program to assure consumer acceptance, hold down cost, and maximize the environmental benefits attributable to RFG.*

Pump Labeling

A possible response to the current concerns regarding RFG is to require labeling of oxygenates used on the fuel pump. While several states today require that ethanol be labeled at the pump, few states require MTBE to be labeled. As a result, most consumers do not know which oxygenates are being used, and cannot avoid, or seek out, a particular oxygenate. Labeling all oxygenates would allow consumers to make informed decisions regarding their RFG choices and could be used to diffuse much of the criticism about the new fuel programs. Numerous groups have supported the labeling of all oxygenates, including MTBE. The National Conference on Weights and Measures (that is responsible for most consumer protection laws), the National Association of State Departments of Agriculture, Citizen Action, the Society of Independent Gasoline Marketers of America, Coloradans for Clean Air, auto manufacturers, and farm groups across the country all support uniform oxygenate labeling regulations.

2.20.1 Method of retail sale. -- All spark ignition engine fuel kept, offered, or exposed for sale, or sold, at retail containing at least one percent by volume of any oxygenate or combination of oxygenates shall be identified as "with" or "containing" (or similar wording) the specific type of Oxygenate(s) in the engine fuel.

National Conference of Weights and Measures model regulation
Adopted 1991

Ethanol/ETBE in the Future

Additional growth in the domestic ethanol industry is still possible and much needed. In the future, ethanol will likely grow into the ether market in the form of ETBE. ETBE is a chemical compound produced in a reaction between ethanol and isobutylene (a petroleum-derived by-product of the refining process). A gallon of ETBE is produced by reacting approximately 42 percent ethanol with 58 percent isobutylene.

Advantages of ETBE over MTBE

- o lower water solubility than MTBE;
- o octane response closer to ethanol than MTBE;
- o excellent distillation curve response to 22%;
- o large reduction in CO and HC emissions;
- o superior drivability;
- o less tendency for engine vapor lock and less evaporation loss due to higher boiling point and lower RVP; and,
- o more effective prevention of phase separation than MTBE.

A recent U.S. Treasury ruling allows ETBE the opportunity to become an important and economically feasible alternative to petroleum-based MTBE. The Department's ruling, when finalized, will greatly enhance the commercial viability of ETBE in a highly competitive ether market, providing refiners with an additional option in meeting the requirements of the reformulated gasoline program. In fact, the proposed regulation has already spurred several major oil companies to begin producing ETBE.

Another future new market opportunity for ethanol is in the form of a "neat" or replacement fuel. Provisions of the Clean Air Act of 1990 and the National Energy Policy Act of 1992 created significant new market opportunities for alternative fuels, including ethanol, methanol and natural gas, by phasing in requirements for fleet vehicles to operate on cleaner fuels. It is estimated that by 2005, as many as 5 million vehicles will be running on non-petroleum motor fuels. Ethanol may soon also compete in this new market.

Conclusion

The past several years have seen the domestic ethanol industry grow from an under-utilized midwest market gasoline-extender to a widely sought oxygenate used in CO and Ozone nonattainment areas across the country. The prospects for continued growth in the domestic ethanol industry remain strong. But significant challenges remain. We remain more than 98% dependent on fossil energy for our transportation energy needs. More than half of that is now imported, leaving the United States precariously vulnerable to foreign energy supply disruptions. We need to recognize the economic and energy security threat such a dependence creates, and continue to build support for a growing domestic renewable fuels industry.

NEW USES IN THE 1995 FARM BILL
RENEGOTIATING AGRICULTURE'S CONTRACT WITH AMERICA

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For over sixty years American farmers have kept their contract with America to produce an abundant, high quality and affordable food supply. American consumers enjoy a diverse food supply unmatched anywhere in the world. Unfortunately, the federal government has not performed its contractual duties as well as the farm community. Price and income support programs have not kept small and medium sized farm operations economically viable and export programs have not delivered the demand for traditional farm products needed to match the ever increasing productive power of the farm sector.

Rural communities have suffered job losses due in part to increasing farm sector efficiency, insufficient demand for farm products, idled acreage, and the loss of food processing facilities to suburban and urban locations. Over the term of the contract, many rural communities have dried up and blown away.

Needless to say, agriculture and national needs have changed substantially since the contract was first written. **First**, production agriculture, including the input, transportation, handling and processing sectors, is now a mature and economically powerful industry. Much of the new knowledge and innovation associated with the production of traditional farm products is being generated and distributed by the private sector. With the maturing of this industry and the expansion of international agricultural markets, food security is not the national concern it was sixty years ago.

Second, far fewer people are now directly employed in agricultural production, reducing the economic, social and political influence of this segment of the population. As a result, public understanding of and support for government contractual obligations to the farm community has eroded. Severe budget constraints and the recent change in congressional leadership have added uncertainty to the continued ability of the federal government to perform its contractual duties.

Third, petroleum was a rising economic star when the contract with agriculture was signed. Domestic supplies were abundant and environmental considerations were not yet on the nation's radar screen. Today, the country has a growing petroleum habit that domestic sources cannot supply. Imports of petroleum now exceed 50 percent of annual usage and will continue to increase as domestic production continues to decrease. Smog, carbon dioxide emissions and disposal problems associated with industrial uses of petroleum and other nonrenewable resources are now multibillion dollar burdens for industry and government.

Fourth, new materials processing technologies are vastly expanding the ability to produce high quality economically competitive biobased materials and products. David Morris and Irshad Ahmed, authors of the 1992 report entitled, *The Carbohydrate Economy*, stated:

"We are witnessing a revolution in materials processing technologies. Scientists are learning to disassemble and reassemble bits of matter to achieve virtually any desired property. These technological advances enable us to extract chemicals and make final products from plant matter at a significantly lower cost than was possible only a few years ago."

Fifth, international competition and the integration of computer-based technologies into the economy are challenging America's ability to provide jobs for its workforce. The creation of new industries is vital to the ability of the nation to replace jobs lost to international competition and technological advances.

Because of the terms and scope of its contract with America, agriculture is one of the nation's most underutilized assets. Unmatched in its ability to produce, blessed with fertile soil, plentiful water and moderate weather, America's farm fields are the nation's answer to the Middle East's oil fields. In fact, America's farm fields are better than oil fields because, if properly maintained, they are inexhaustible and produce materials that do not harm the environment.

To unleash this tremendous economic power, America must renegotiate its contract with agriculture to expand its role beyond food, feed and fiber to include ***fuel, energy and industrial materials***. The new contract must encourage and support the development of innovative nonfood products that generate new demand for farm products, jobs for rural America, "green" products for consumers and environmental and energy security benefits for the nation. The New Farm and Forest Products Task Force, in its 1987 report to the U.S. Secretary of Agriculture estimated that the development of these new uses and markets for agriculture could generate \$30 billion in increased farm income and 750,000 new jobs.

Biochemists will tell you, that anything made from a barrel of oil can be made from a bushel of grain or a bale of hay. Current crops can be converted to or modified to produce pharmaceuticals, fuel and high value industrial products. Crop and processing residues (some 350 million tons are produced each year) contain material that can be converted to useful nonfood products creating added value to farm crops and new jobs in processing plants.

Forty to sixty million acres are idled each year through the conservation reserve and annual set-aside programs. A significant portion of these acres could be put to economic use producing crops (grasses, perennials and fast growing trees) that maintain soil and water quality and provide wildlife habitat and open space.

Clicking our heels together like Dorothy in the Wizard of Oz will not, however, make industrial uses magically appear. For sixty years the petroleum industry, with the government's help, has been investing in research and development. Under the terms of America's current contract with agriculture, very little has been invested in developing nonfood uses of agricultural materials.

In FY95, less than four tenths of one percent of the U.S. Department of Agriculture's total spending on agricultural and rural development is being invested in the development of new nonfood uses of agricultural and forestry resources. Regulatory and programmatic barriers to nonfood uses of agricultural resources abound within the Department of Agriculture and throughout the federal government. Industry decision makers and the public must be convinced that ag-based products can perform like petroleum based products.

The 1995 Farm Bill presents an opportunity to negotiate a new contract between America and the agriculture community, one that will enable agriculture to be an engine of economic growth, environmental progress and energy security into the 21st century.

This new contract must make it clear that agriculture is more than food feed and fiber. It must help communicate that fact to industry and the public. Regulatory and programmatic disincentives and barriers to the development and marketing of these products must be removed. Investment incentives are needed for industry to develop and commercialize new products and technology. The Department of Agriculture must be given clear direction and the resources to develop and implement a comprehensive strategy with specific goals and timetables.

The New Uses Council, a nonprofit membership organization is dedicated to facilitating the renegotiation of agriculture's contract with America through the 1995 Farm Bill. Toward this end, it has undertaken several activities including the following:

- 1) Development of a *New Uses Briefing Book*. The book contains the thoughts and ideas of knowledgeable individuals from the public and private sectors on the issues, markets and politics associated with nonfood uses of agricultural resources as well as the collective thoughts and recommendations of the nine regional meetings;
- 2) Nine *Regional Meetings* are being held, from coast to coast, to facilitate discussion, mobilize support and identify specific actions that can be taken through the 1995 Farm Bill to help accomplish our goals. These meetings will be completed by March of 1995;
- 3) A *New Uses Task Force*, comprised of representatives from the regional meetings and the New Uses Council will convene in Washington, DC on April 6-7 to develop a set of recommendations based on the work of the nine regional meetings; and
- 4) The *1995 Ag Summit on New Uses* will be held in Washington, DC on May 3-5. The second annual new uses summit will consider the recommendations of the regional meetings task force, hear about new uses development activities in Europe and Asia, hear from congressional agricultural leaders and discuss current federal new uses activities.

AGRIBASED COSMETICS AND CONSUMER RELATED PRODUCTS

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Abstract

The chemical substances utilized widely in consumer products, and for pharmaceutical and agricultural uses are generally referred to as specialty chemicals. These may be flavor or fragrance substances, intermediates for synthesis of drugs or agrochemicals or the drugs or agrochemicals themselves, etc. These are in contrast to chemicals which are utilized in large quantities for fuels or preparation of plastics, lubricants, etc., which are usually referred to as industrial chemicals. The specific utilization of specialty chemicals is associated with a specific important physiochemical or biological property. They may possess unique properties as lubricants or waxes or have a very desirable biological activity such as a drug, agrochemical or cosmetic or perfume ingredient. These unique properties convey significant economic value to the specific specialty chemical. The economic commercial production of specialty chemicals commonly requires the isolation of a precursor or the specialty chemical itself from a natural source. Also important are those cases where plant materials are utilized directly in the consumer products; i.e., spices and herbals. The discovery, development and commercialization of both chemicals and botanical products is presented and reviewed. The economic and sustainable production of specialty chemicals and herbals is discussed.

Biological diversity is the name we give to the occurrence of many of the different kinds of organisms found in the world. It is important to recognize that biological diversity is an outward evidence of chemical diversity. All organisms interact with other organisms and their environment by chemical means. Plants, organisms which are fixed in place and cannot flee injury, have evolved chemical defenses to protect themselves. Many insects find mates by releasing attractant chemicals into the environment to allure mates. Prey and predators interact through chemical scents as well as sight. Even humankind's exploitation of organisms is based largely upon our utilization of specific chemicals produced by those organisms. All of our foods are, in reality, chemicals as are our natural fibers and all of our medicines.

Aside from their value as sources of food, drugs or industrial raw materials, plants are important to man in many other ways. One can hardly imagine modern society without soaps and toiletries, perfumes, condiments and spices, and similar materials, all of plant origin, which enhance our standard of living. Furthermore, the roles of forests and other types of natural vegetation in controlling floods and erosion, climate regulation, and in providing recreational facilities are of immeasurable value.

Living organisms are remarkable in their ability to produce a vast number of diverse metabolites ranging in chemical complexity and biological activities. These interesting chemical substances are commonly referred to as natural products. The higher plants with their greater genetic diversity are recognized as the richest source of the most diverse types and number of natural products. Chemicals derived from higher plants have played a central role in the history of humankind. The Age of Discovery was fostered by explorations to find more economic trade routes to the East to bring back plant-derived spices and other products. Indeed, the discovery of the New World, whose 500th anniversary we celebrated recently, was a direct consequence of that effort. The prototype agent for a majority of our classes of pharmaceuticals was a natural product of plant origin. The common thread of plant-based natural products research is identification and development of specific plant-derived substances having a desired selective physiochemical property or biological activity. In this regard, it is important in the discussion of discovery from natural sources to appreciate fully the importance of the "prototype" discovery, for it is this discovery that paves the way for significant new developments. In general, it should not be viewed as necessary to discover an agent which is safer and more efficacious than known agents (although this is always desirable). The compound discovered as a natural product will not likely be the final agent in the marketplace (although there are numerous examples of such cases). Rather, it is expected that such **prototype** agents will define a new "class" which would be subject to refinement through standard structure-activity relationship studies, improved formulation and delivery, etc. Thus, one need only demonstrate the desired physiochemical properties or biological activity of the agent and thus its potential for future development.

The chemical substances utilized widely in consumer products, and for pharmaceutical and agricultural uses are generally referred to as specialty chemicals. These may be flavor or fragrance substances, intermediates for synthesis of drugs or agrochemicals or the drugs or agrochemicals themselves, cosmetic substances, etc. These are in contrast to chemicals which are utilized in large quantities for fuels or preparation of plastics, lubricants, etc. which are usually referred to as industrial chemicals. The specific utilization of specialty chemicals is associated with a specific important physiochemical or biological property. They may possess unique properties as lubricants or waxes or have a very desirable biological activity such as a drug, agrochemical or perfume ingredient. These unique properties convey significant economic value to the specific specialty chemical. The economic commercial production of specialty chemicals commonly requires the isolation of a precursor or the specialty chemical itself from a natural source.

A general structural feature of natural product molecules is their optical activity. With very few exceptions the different optical isomers of a substance possess significantly different biological activity. The observed differences in biological activity may be due to a difference in the distribution of the isomers or to a difference in the properties of a drug-receptor combination if less than the optimum number of binding groups is suitably located for binding. Differences in distribution occur as optical isomers are selected by some other asymmetric center in the biological system before the isomer reaches the specific receptor. This may be due to optically active processes such as selective penetration of membranes, selective metabolism or selective absorption at sites of loss. The difference in reactivity of enantiomorphs at the receptor site may be explained if three different portions of a molecule must interact effectively with the receptor site to bring about the biological response. It is readily discernible that in this case only one of the enantiomorphs has the correct orientation of all three portions to fit at their respective sites and thus produce the response.

With the discovery and development of fermentation based natural products beginning in the early 40's and the increasing sophistication of synthetic organic chemistry, interest in plant-derived natural products as prototypes waned greatly during the decades of the 60's, 70's and 80's. Today a re-interest in the potential of substances found in higher plants to provide prototypes for new pharmaceuticals, agrochemicals and consumer products is being evidenced. Until recently, efforts to realize the potential of plant-derived natural products have been very modest and largely restricted to discovery programs centered in academic settings.

A number of changes in capability are fostering a renaissance in natural products research. Foremost among these are the advances which have been made in bioassay technology over the last several years. We now have highly automated, very specific and selective bioassays in which complex mixtures of materials can be rapidly and cost effectively evaluated. Indeed, advances in bioassay technology have been so great that the availability of materials to evaluate has become more limiting than the ability to carry out those evaluations. Once biological activity has been demonstrated in an appropriate bioassay or primary screen we now have available, based upon advances in separations and structure elucidation technology, the capability to isolate, purify and determine the chemical structure of the active principle in a few weeks, or, at most, a few months. Those separation advances are particularly associated with high performance chromatography methodologies including high performance liquid chromatography, high performance supercritical fluid chromatography and capillary electrophoresis. Most recently, improved methodologies in counter current partition chromatography have further expanded our capabilities for separations. Structure elucidation technology has evolved particularly with the development of high field NMR spectrometry as well as high resolution technologies in mass spectrometry. Most important are the two dimensional NMR techniques that have been developed which allow very rapid and straightforward assignment of structure to complex natural products. Additionally, the technologies of coupled liquid chromatography-mass spectrometry and similar techniques provide very potent or powerful methodologies for separation and structure elucidation. Further as an increased understanding of biological and physiological pathways in all organisms is reached, much more specific and selective questions with regard to potential drug application can be formulated, that is, for example, the investigation of substances which interact only with a very specific receptor rather than with a family of receptors and with the advances that have been made in biotechnology those receptors can be cloned and "constructs" prepared in which cloned receptors become a component of a created cell line which then ultimately forms the basis of a high throughput very selective and specific bioassay. In this way, the advances in several areas can be put together to focus upon the discovery of new substances as prototypes for pharmaceutical development. Natural products represent the most important source of unique chemical substances for evaluation with these new assaying strategies for potential pharmaceutical utility.

Another issue that is fostering a renaissance of interest in natural products research is the recognition that the biological diversity of the earth is diminishing rapidly. Indeed, one cannot pick up a newspaper or news journal without encountering some article dealing with the rate, consequences, cause, etc. of loss of biological diversity. However, it must be emphasized that it is the loss of chemical diversity represented by those organisms that represents the true loss, the possible utilization of those chemicals for the benefit of humankind will be lost. Even the foodstuffs, the building materials, the fibers that are utilized to make clothing, etc. are chemicals derived from nature and it is, indeed, the complex and unique natural product chemicals found in the various kinds of organisms that create the chemical diversity that may be evaluated for pharmaceutical or agrochemical discovery and development. The loss of those organisms and, in turn, the loss of the chemical diversity represented by those organisms, is a very important issue stimulating natural products research.

Another important consideration is that an era of worldwide economic competition is underway. Indeed, in the U.S. at the moment, the pharmaceutical industry still represents one of our important areas of worldwide industrial leadership and the recognition that the discovery and development of new pharmaceuticals and agrochemicals maintains the competitive position of that industry leads to interest in natural products research to increase the efficiency of discovery and development. So worldwide competition does motivate a certain portion of the new interest in natural products research that can be observed. And finally, the historical success of the approach of evaluating natural product preparations for pharmaceutical, agrochemical and other consumer product discovery and development must not be overlooked. Indeed, one can demonstrate that nearly all pharmaceutical classes were derived from natural product prototypes. Relatively few exceptions exist to that general statement.

So the historical success of evaluating natural products for discovery and development and the increased capabilities that have been reviewed, contribute greatly to a renaissance in this area for new discovery and development activities. However, I believe an important consideration or nagging concern which is still responsible for the significant reluctance to initiate a higher plant based natural products research and development program, especially on the part of the private sector, is the issue of natural product chemical supply.

Three approaches may be taken for the production of specialty chemicals, (1) Total synthesis from simple petroleum or coal-derived substances (industrial chemicals), (2) Partial synthesis utilizing relatively complex substances isolated from natural sources such as plants or animals and the transformation of those precursor substances into the desired end product, or (3) Isolation of the substance itself from a natural source (biomass). A serious limitation of the production of specialty chemicals by total synthesis from simple, industrial chemicals is that such syntheses produce racemic mixtures of the resultant products which must finally be resolved into their respective enantiomorphs. This resolution process is expensive of time and reagents and by definition results in one half of the final product as a by-product. If an asymmetric synthesis approach is employed, this may provide only the desired enantiomer but usually utilization of costly asymmetric reagents causes such an approach to be uneconomic. The alternative approach of utilization of relatively more complex natural products as substances from which to synthesize end product specialty chemicals does not suffer this limitation because the starting natural products already possess optical activity. This approach is most notably utilized in the production of steroid based pharmaceuticals from plant sterols, bile acids or plant sapogenins. The quantity of precursor required to be isolated from a natural source is dependent upon the efficiency of the process utilized for the transformation of the precursor to the desired end product specialty chemical.

In order to discuss the third approach to production of specialty chemicals, namely isolation of the substance itself from biomass, let me take a more or less extreme example to illustrate the quantities of substance that would be required to provide for production of a plant-derived specialty chemical.

If we assume a worst case of 0.001% of substance isolated from biomass and 2,000 kilograms of substance would be needed to meet market demand, then 200,000,000 kilograms of biomass would need to be processed to provide the required material. This, at first thought, would seem to be an inordinate quantity of biomass to produce and process. Looked at another way, that is equivalent to 7.5 million bushels of corn, a quantity equivalent to 0.1% of an average U.S. annual production and easily produced in an average corn producing county of a corn producing state such as Iowa or Illinois. Clearly these are quantities of biomass which can be readily produced and processed if thought and planning for a system for drug plant production is initiated.

Wild populations of plants may not be a reliable source of chemical and their harvest may be counter-productive to the development of a reliable, cost effective, long-term production system of a natural product substance. Several unpredictable and uncontrollable phenomena preclude establishment of a stable cost of production of the material if it is produced from biomass harvested from wild populations: Forest fire, annual climatic variations, natural variation and presence of chemotypes of wild populations; increasing societal pressures to protect and regulate harvesting of wild plants, high cost of collection of scattered plants often in rough or inaccessible terrain and transportation to processing facilities and lack of assured accessibility of populations which occur on public and privately held lands. Reliance on harvest of wild plants for production may lead to uncontrollable interruption of supply.

Even more critical is the fact that wild harvest risks the destruction of germplasm essential for the future cultivation of the plant for drug production. This includes genes for disease and pest resistance, hardiness, and tolerance to full sunlight, drought and flooding as well as genes for high growth rates and high chemical production. The preservation of these wild genes can be critical to development of long-term, cost-effective supplies whether produced by cultivated plants, tissue culture, or genetically modified microorganisms. Because of the critical role wild germplasm will serve in future production strategies, the preservation of wild populations should be considered an essential component of the development strategy for specialty chemical production.

Lack of a stable and reliable supply of plant-derived specialty chemical at a predictable cost will even more significantly impede commercial utilization of the agent. Procurement of chemical by harvest of limited wild populations may not be an appropriate strategy to provide the agent once utility is established. Development of a sustainable, economic and reliable source is imperative.

The appropriate alternative may be production from a cultivated plant source. An advantage is the known genetic origin and uniformity of cultivated plants. Additionally, cultivation will provide high plant densities in defined locations which will significantly reduce collection and transportation costs. Two strategies may be taken to accomplish this: (1) to bring into cultivation the currently recognized source of drug; (2) if the plant source of the chemical is already in cultivation to evaluate and select currently cultivated varieties for chemical or precursor content. Strategy One is fraught with many problems and uncertainties associated with the introduction of a new plant into cultivation, a process which has been successful in bringing into cultivation approximately 3,000 species of the estimated 300,000 plant species thought to occur in the world. We will not detail all of those uncertainties. However, as our understanding of agronomics and plant biology has increased, we can have ever-increasing confidence in our ability to bring into cultivation the plant source of a chemical. Even with success, a period of several years may be required for this strategy to provide a reliable source for production. Additionally, the necessity of recovering the investments made during the development period will impact the economics of this strategy to provide a source for the substance. In contrast, Strategy Two, selection of currently cultivated varieties for chemical production, presents the advantage that a proven cultural system is in place which may be rapidly expanded to provide biomass for production of the desired natural product chemical.

Any system for production of a plant-derived natural product must meet certain criteria. It must be economic, sustainable, reliable and non-environmentally impacting. These over-arching criteria can be met if a careful and systematic evaluation of each step of the production system is made. Key to the solution of natural products supply issues is a "systems" approach which considers all elements of production. These include consideration of:

- **Analytical Methods Development.** Rapid, convenient and robust methods of analysis of biomass and other matrices for the presence and concentration of the desired chemical substance must be developed. The ability to analyze for the concentration of the specific chemical or precursor underpins all further production system development.

- **Plant Selection, Identification and Collection.** Various strategies may be utilized for selection of likely sources of the desired chemical substance all drawing extensively upon data bases identifying sources of botanical diversity, distribution and population densities. Accurate plant identification is essential. Collection of potential sources must consider the terms of the Biodiversity Convention.

- **Genetic Selection of High-Yielding Plant Material.** Selection of high-yielding and consistent genetic material to improve the economics of natural products production is a priority. High-yielding cultivars must be developed and employed in cultivation for natural products production.

- **Agronomics to Enhance Chemical Yield.** One must discover the growing conditions that maximize concentration of the required natural product in the selected cultivar. The role of water, soil and nutrient conditions, and the impact of stress in the plant's environment on yield and biosynthetic preference should be carefully evaluated.

- **Harvesting and Handling to Enhance Yield/Productivity.** Seasonal variation, variation during the day/night cycle, timing of harvest, and handling and storage conditions are important factors that influence the yield of a natural product. Mechanized methods of efficiently harvesting plant material must be developed.

- **Drying Technology to Preserve Drug Content.** Ordinarily plant biomass is dried to stabilize the concentration of chemical present. The method of plant drying can dramatically reduce or occasionally enhance the yield of natural product. It is not uncommon for losses of two-thirds to 95% to result from improper drying.

- **Superior Storage System.** A controlled storage system that retains the drug content in the plant biomass will reduce dramatically the capital requirement for chemical processing because smaller batches can be processed over the entire year, rather than much larger batches only during the harvest season.

- **Extraction/Purification to Maximize Chemical Yield.** Exhaustive, highly selective extraction techniques must be developed. Process development should emphasize simplicity and step reduction to optimize economy and yield, and to reduce waste products. The use of chromatography should be avoided as much as possible; if necessary, it should be included at a later purification stage to minimize sample load.

A second area for consideration is that wherein direct utilization of the plant biomass as the consumer product is the normal practice. Two specific cases come to mind - spices and herbals. The use of botanicals (herbals) as dietary supplements has recently received much needed regulatory recognition with the passage of the Dietary Supplements Act of 1994. This will create a greatly expanded market for these materials, a very important opportunity for American agriculture.

Many of the traditional sources of spices and herbals for use in the United States have been from foreign countries. Several factors should be considered which will make current foreign sources of spice and herbal plants less attractive in the future. First, overseas freight rates are climbing so

that shipping costs are rapidly making the materials more expensive. Second, the plants are often collected in the wild, rather than being cultivated, and some of the traditional sources are disappearing with changing land-use patterns. Third, labor for harvesting plants has traditionally been native labor and paid very little, but wage scales are changing and labor will no longer be cheap. Fourth, the foreign processing operations are often crude and offer several avenues for contamination and adulteration. Imported dried spices are often found to have widespread contamination by soil, weedy plant parts, insects, animal droppings and fungi. Finally and perhaps most important is the effect of political developments on supplies. Political upheavals or embargoes can disrupt or even curtail supplies of imported materials with the resultant disruption of the United States economy.

Discovery and development of new plant sources of spices and herbals and development of domestic sources for production of already utilized materials provides opportunities for agricultural and industrial expansion that could benefit farmers, consumers, industry and the Nation as a whole. New-crop and plant product development could: diversify and increase efficiency of agricultural production; improve land resource use, offer increased economic stability to farmers, create new and improve existing agriculturally related industries; increase employment opportunities, provide consumers with new products, provide industries with alternative sources of raw materials, help improve the Nation's balance of payments through import substitution. The development of new crops from plant extracts offers many potential social, economic, and ecological benefits on both the local and national levels. Two general approaches may be taken to accomplish this end; (1) Domestic production of established spices and herbals and (2) Discovery of new native plants with spice, flavor or fragrance potential.

1. Evaluation of the Agronomic Potential for Domestic Production of Established Spice and Herbal Plants.

Background

The concentration of U.S. agriculture on a small number of major crops invites economic instability. The economics of many agricultural areas are based on one or a few crops commonly grown in monocultures, leaving farmers vulnerable to the effects of environmental stresses and market conditions. New crops could provide alternatives to traditional crops and opportunities to develop new agronomic systems such as multiple-cropping or inter-cropping. Production of two or more crops offers an economic buffer in the event that one of the crops fails or the market price drops. Widening the crop base also would enable the farmer to choose a plant species best suited to local agronomic conditions. An improved match of crop and resources could help reduce increasingly expensive and scarce inputs of energy, chemicals and fertilizers.

Domestic production of established spices and herbals could have a beneficial economic impact through import substitution. Several hundred million dollars are paid for importation of the raw materials going into the production of spices and herbals consumed in the U.S. each year. Domestic production of those materials would infuse those payments back into the U.S. economy with the attendant stimulatory effect on growth, employment opportunities, etc. Finally, domestic production of established spices and herbals would provide U.S. industry with stable and reliable sources of quality raw materials.

Rationale

That many of the established spices and herbs will grow and flourish in the U.S. is evidenced by the practice of many hobby gardeners of producing their own table spices and herbs in home

gardens. The possibility of import substitution and increased income for small farms specializing in herb and spice production with the attendant improvements in the quality of life for many depressed rural areas suggest that efforts to determine appropriate agronomic practices for domestic spice and herb production should be undertaken.

Research Protocol

A. Correlation of the growth requirements (soil type, climate, etc.) of established spices and herbs with those available in the U.S.

B. Market analysis of the potential for economic production of those herbs and spices which would grow in the region.

C. Development of agronomic practices for production of quality herbs and spices.

D. Development of marketing practices to allow introductions of domestic produced spices and herbs into commerce.

2. Discovery of New Native Plants with Spice, Flavor or Fragrance Potential.

Background

The utilization of flavor and fragrance materials (essential oils) derived from plants for the enhancement of foods and incorporation into cosmetics and toiletries is as old as civilization. Indeed, it is hard to imagine modern society without these substances. Interestingly, a large majority of those materials which are utilized thusly are derived from old world sources - either Europe (particularly the Mediterranean region) or Southeast Asia and China. One may speculate that this dominance of the old world regions as sources of these materials is more due to historical happenstance than because plants bearing pleasing flavor and fragrance properties are restricted in occurrence to those regions. Indeed, many plant species related to those which are established sources of essential oils are native to the United States. Further, the botanical literature is replete with references to additional species with significant aromatic properties. Finally, the folk literature and the literature pertaining to cultural practices by the various groups of Native Americans contain numerous references to the utilization of specific plants for their aromatic properties. All of these sources should provide ample leads to new native plants with spice, flavor or fragrance potential.

Rationale

The commercial market for essential oils is a multimillion business when one considers the total of flavoring and fragrance utilizations. Also there is a constant striving to develop "new" and "different" flavors and fragrances - this is particularly the case in cosmetics and toiletries. That previously unexploited native sources of such materials may be developed provides compelling justification to undertake efforts to discover new native plants which may be utilized for essential oil production.

Research Protocol

A. Identification of native plant genera and species likely to possess aromatic essential oils. Particular attention will be given plants reputed to have been used for herbals, flavorings, amulets,

etc., because of their aromatic properties and to members of plant families and genera known to be rich in essential oils.

B. Collection of plant material and taxonomic verification.

C. Preparation of steam distillates and extracts by standardized procedures.

D. Characterization of the oil fingerprint both by physiochemical means - particularly capillary gas chromatography and capillary gas chromatography - mass spectrometry - and by organoleptic means - smell and taste.

E. Evaluation of the toxicity of the essential oil by standard toxicity assays.

F. For those plants producing essential oils having market potential, efforts should be undertaken to determine the agronomic potential of the plant for commercial cultivation.

In conclusion, the production of consumer products, especially those based upon the presence of specific chemical substances, natural products, in plant biomass hold great economic potential for American agriculture. Modest, focused research and development can realize that great potential for the benefit of both American farmers and American consumers.

**BIODEGRADABLE POLYMERS:
*THE OPPORTUNITIES AND
CHALLENGES FOR AGRICULTURE***

Bob Buehler
EcoPLA™ Marketing Director, Cargill, Inc.

As citizens of the global village, the human race will face two crises in the years ahead, and from these crises will come opportunity for agriculture in general and bio-based products in particular.

First, there is an emerging environmental crisis in the form of solid waste management. According to the most recent estimates by WorldWatch Institute, worldwide population is expected to double by the year 2050. Quite obviously, this will result in significant additions to the waste stream and significant withdrawals from the earth's bank of natural resources.

Plastics, despite the many ways in which they improve the quality of life, have become a lightning rod for environmentalists and others concerned about the welfare of this planet. They believe that worldwide consumption of plastics -- about 200 billion pounds annually -- creates a number of environmental problems, including the inability of many plastics to break down and the enormous cost of managing and disposing of plastic waste.

Second, there is an emerging energy crisis. As worldwide population grows, and percapita income increases in industrialized nations, the demand for non-renewable petroleum resources will increase. Currently, the U.S. consumes 4 million barrels per day more for transportation than it produces, and that number will increase to 9 million barrels per day by the year 2010. By then, according to the Energy Information Administration, the transportation sector will consume 14.1 million barrels per day, 60 percent of which will be imported. Obviously, while the world currently is blessed with abundant supplies of cheap oil, at some point in the future this will not be the case.

From these crises comes opportunity for agriculture in the form of biodegradable polymers made from corn and other renewable resources. These products can help address these emerging crises on two fronts. First, biodegradable products can ease some of the pressure on solid waste

management systems to dispose of plastic. Second, packaging and other consumable goods made from renewable resources can ease some of the future supply and demand pressure on petroleum, freeing its availability for priority transportation use.

With an aggressive effort, sales of biodegradable polymers could reach 6 billion pounds annually by the year 2010, or about 8 percent of the total commodity polymer market. This would consume 800,000 bushels of corn per day.

Some would say this isn't a lot of corn, considering that a medium-sized corn milling plant can process about the same amount of corn in a week. But it would be a market that does not currently exist, and this market would in turn create the need for new processing facilities and as many as 4,000 primary jobs and 10,000 indirect jobs. And it would be a market that could be supplied with ease. According to the USDA, the U.S. could ramp up corn production by 50 percent over a five-year period without taxing the country's existing collection, transportation, and storage infrastructure.

This opportunity for agriculture could not come at a better time. In the years ahead, U.S. agriculture will face tougher competition for its share of the world marketplace. And, it will face greater pressure to reduce dependence on government and taxpayer assistance. Producers and agribusiness are not blind to the potential impact of these issues. But rather than dwelling on the negatives, they must chart new courses ... courses which will lead to new markets and new opportunities for farm profits.

Realizing the potential of this new technology for agriculture will not be easy, however. Several obstacles stand in the way, and they must be overcome before farmers reap the benefits.

Cargill is one of several companies developing proprietary processes and products in the area of biodegradable polymers. Cargill's product, EcoPLA, is an environmentally engineered material made from polylactic acid, or PLA, which is a product of corn processing.

PLA performs like petroplastic, both from a manufacturing and end-use perspective. It can be used for many applications, from plastic bags to foodservice utensils to horticultural mulch film. And, of course, it is degradable.

It is not, however, a completely new product. Polylactic acid was introduced in 1932 to the textile fiber industry, but poor hydrolytic properties prevented its acceptance.

The 1970s brought renewed interest, however, and these same hydrolytic properties proved to be a virtue for certain biomedical applications such as dissolvable sutures and bone screws. But the high costs of separation, purification and polymerization of lactide prevented its use beyond the medical industry.

In the 1980s, growing concerns about solid waste management brought a new wave of interest in biodegradable plastics as alternatives to petroplastics. This led to the development of a first generation of biodegradable materials. These materials were plagued by production and performance problems, but they nevertheless represented a step forward.

Around 1990, commercial introduction of a second generation of biodegradable polymers emerged in both Western Europe and the United States. These included starch-based polymers and several families of polyesters ... polylactides, polyhydroxybutyrate-valerate, and polycaprolactone, which has been used for more than 20 years but not for biodegradable applications.

Cargill became interested in biodegradable polymers from polylactides in 1987 as a possible new use for corn. It seemed a good fit, since PLA can be produced from the food ingredient lactic acid, which is made from dextrose. Dextrose was readily available from the corn milling business and Cargill was already fermenting citric acid and ethanol from dextrose.

Significant progress has been made. Recently, Cargill developed and patented a continuous process to economically produce PLA from lactic acid. This process is capable of producing a family of polylactide polymers with high purity and high molecular weight at a lower cost than previously possible.

In the spring of 1994, the company established an \$8 million pilot facility to make PLA from natural lactic acid. The plant has an annual capacity of 10 million pounds and the company is currently producing and testing a variety of commercial grade products with various physical and rheological properties. Cargill believes many of these products have the potential to be "drop in" replacements for conventional polymers.

So, after many years of significant investments in research and development, Cargill is beginning to market-test a number of product applications of low-cost biodegradable polymers made from renewable resources. While large-scale commercial production is still a few years away, the company is nevertheless pleased with the technological progress made. To date, Cargill has filed more than 25 patents on the processes and products relating to this technology.

CHALLENGES TO COMMERCIALIZATION

Specifically, there are five challenges that must be addressed for biopolymers to reach their full potential.

The first is product performance. Aside from the obvious benefit of degradability, PLA has unique properties that make it a good thermoplastic based on performance alone. It has sufficient toughness for most uses and can be modified to be stronger than polystyrene. It can have equal

or better impact resistance than polypropylene. It is resistant to oils and therefore will not craze. It offers good storage stability. And it has a high surface energy that makes it very easy to print.

However, a major challenge for biopolymers is improving functional performance without adversely affecting degradability. Of particular concern are thermo-mechanical properties ranging from softening temperature to flexibility to chemical stability. To address some of these issues, completely new technology must be developed.

Successful introduction of biopolymers is possible only with additional process, product, and applications research, not only for the polymer itself but for a wide range of derivative products, including copolymers, blends, alloys, and filled or reinforced grades.

In addition, the development of renewable resource-based additives must progress on a parallel pace with base polymers. Without these ingredients, property modifications will be challenging and the product category "renewable biopolymers" may not exist. While Cargill is not limiting its research to renewable resource-based materials, from a marketing perspective the company has a strong preference.

Clearing these technological hurdles will be difficult and expensive. Several companies have invested millions of dollars over the past several years, and the market for low-cost biodegradable polymers is only now being commercially tested for the first time. After all, it has taken some 50 years to get conventional polymers to their current state of development.

Developing and commercializing new technologies is becoming increasingly time-intensive and expensive. Few companies these days have pockets deep enough to justify significant investments in R&D projects, especially those that may not be aligned with core businesses or which will not bear fruit for many years. Partnerships within industry, and between industry and government, are critical to maintaining the level of resources necessary to advance these technologies.

While the U.S. initially established a technological leadership position in biodegradable polymers, most of the patents in recent years have gone to Japanese companies. The Japanese Ministry for Trade and Industry has been instrumental in shaping enabling legislation and in helping Japanese companies develop biodegradable polymer technologies.

Cargill is committed to helping the U.S. maintain a technological leadership position in an environment characterized by increasingly stiff competition. All the more reason for Cargill -- and other companies with similar technologies -- to identify government, industry, and special interest partners to help advance these products, not just for the benefit of agriculture but for the competitiveness of the nation. Without broad-based commitment, the investment Cargill and others have made to date may be wasted, and the potential benefits of an emerging industry to the agricultural economy and U.S. competitiveness could be lost to others.

Fortunately, some promising research partnerships are beginning to emerge. Two examples come to mind. The USDA's Alternative Agriculture Research Center has been instrumental in providing funding assistance to new use ventures. And the Advanced Technology Program, ATP, sponsored by the National Institute of Standards & Technology, provides support on a cost-sharing basis to industrial research and development projects with significant potential for stimulating economic growth. Cargill was recently awarded funding from ATP to work on improving some of PLA's material properties.

The second challenge is economics. For commercial success, biopolymers must not only offer functional performance, they must be sold to end-users for little or no premium over competing conventional systems. Solving the aforementioned technical issues will expand the market only if the cost of PLA is in line with competing materials.

Fortunately, due to the nature of Cargill's traditional commodity businesses, achieving cost efficiencies in bioprocessing systems is considered a core competency. The cost of Cargill's PLA is not yet competitive with petroplastics, but it is moving in the right direction and it may be possible to produce EcoPLA for less than one dollar per pound, which would put it in a competitive arena with conventional thermoplastic polymers such as PE, PS and PET.

To achieve wide acceptance, it is critical not only to control the cost of the new materials, but to identify applications in which any premium paid for the polymer is "diluted" by another low-cost material. In the case of PLA-coated paper, for instance, lower grades of paper can be used due to the inherent strength of the polymer.

Finally, economic assessments must consider the total system cost of the polymer, not just its selling price. The system cost includes all costs, including manufacture, delivery, use and disposal. Product disposal costs, energy costs, product responsibility issues -- like the German "Green Dot" laws where the producer of packaging is responsible for the packaging even after the consumer throws the product away -- all are impacting company ingredient purchasing decisions. For many companies, the view of cost has been broadened to include environmental assessment through life cycle analysis.

From a total life cycle cost perspective, PLA looks promising because it has the potential to reduce the amount of non-renewable ingredients used, minimize wasted energy and decrease environmental impact and disposal cost. But these potential economic advantages must be *in addition to* a competitive price at the ingredient level.

Failure to achieve a favorable economic view from all aspects will in effect relegate bioplastics to small-volume specialty markets which will be of little benefit to agriculture as a whole, nor will it take enough pressure off petroleum supplies to help the country achieve a diversified energy policy.

The third challenge is lack of a composting infrastructure. While biopolymers like EcoPLA are compatible with most every type of waste management system, composting allows products to achieve their full potential of converting waste into water and humus for the Earth. Some of the earlier bioplastics did not live up to expectations for degradability, but the new generation of materials is much improved. In laboratory tests, EcoPLA degrades to carbon dioxide and water at about the same rate as cellulose. Hydrolysis converts EcoPLA to lactic acid, which bacteria in turn reduce to carbon dioxide and valuable humus, which can be used to enrich and restore the soil and agricultural and horticultural applications.

It is highly unlikely, however, that biodegradable products will ever realize their full potential without the availability of composting systems. It is also unlikely that the federal government will accept the designation of a material as "biodegradable" unless a disposal pathway is also identified.

In some European countries, as much as 40 percent of municipal solid waste is composted, but in North America the practice is just gaining momentum. Of the nation's 2,500 composting sites, only 1 percent are designed to accept mixed organic wastes. Most are limited to yard and leaf waste.

But government, industry and the environmental community are beginning to understand and accept composting as a "logical next step" to recycling as a way of diverting part of the waste stream away from landfills, and there is increasing interest in establishing more municipal composting sites. While recycling alone is capable of recovering up to 25 percent of the waste stream, recycling in combination with composting can recover up to 70 percent. And about 40 percent of the material normally sent to landfills can be composted. That includes food waste, agricultural waste, non-recyclable paper products, and new, compostable plastics.

Accelerating the development of a composting infrastructure will require changes in technology and regulations.

From a technological perspective, composting on a commercial scale is still in its infancy. Composting has traditionally been considered a low technology venture. Until the composting process is managed like any other manufacturing process, it will be perceived negatively by the uninformed and poorly managed facilities will continue to create odor problems -- and public image problems -- for the rest of the composting community.

Much more work is needed to develop and understand new composting protocols, perhaps using specially adapted bacteria or fungi and greatly improved process controls for the disposal of mixed wastes containing biopolymers. And, there is a need for additional development work alternatives such as the in-vessel composting systems now in limited use in Europe, Canada and Japan.

From a regulatory perspective, the relationship between composting and recycling must be defined. Composting is often characterized as a threat to recycling. And yet nothing could be further from truth. The primary goal of recycling is the diversion of plastic from landfills. There will be applications where biodegradability and compostability enhances the diversion of plastic from landfills and thus accomplishes the same goal as recycling. Some applications -- like soiled food containers and coated paper -- annually account for some 16 billion pounds of U.S. plastic waste which is either technically or economically difficult to recycle. If these products could be composted, the use of degradable polymers would reduce the amount of plastic and other wastes headed for landfills. Unless composting is classified as recycling or allowed to be included in diversion goals, some states will have a difficult time meeting their municipal solid waste objectives.

Recycling and composting are complementary. In fact, biodegradation of renewable resource-based materials through composting can be considered recycling in the fullest sense if the resulting product is used as a soil supplement. It is easy to envision a closed loop system whereby plastic made from corn is returned to the soil to grow more corn. Is this not the embodiment of sustainable agriculture?

It is important for agriculture to enter the composting dialogue, not only because composting will facilitate a market for corn-based products, but because agriculture is part of America's growing waste problem. It is agriculture's responsibility to explore and support sustainable practices that return back to the land what it has removed.

The fourth challenge to renewable resource based polymers are regulatory and legislative disincentives. Currently, there are two regulatory trends which have the potential to negatively influence the development of the renewable biopolymer industry. Like the battle between composting versus recycling, the intent is good but the result is damaging to this developing industry.

The first trend is recycled content mandates. Recycled content mandates impose restrictions by requiring a certain level of recycled material to be contained in an article. The goal is to create or stimulate the market for recycled material. But in many cases, the benefit of degradability will be more appropriate to diverting plastic from landfills.

The second trend is banning or taxing the use of plastic. In this extreme case, the benefits of plastic products are not realized because they are forbidden to be used. And, more important for agriculture, bans and taxes simply reduce the potential market for biopolymers and the demand for corn as a non-food ingredient.

In addition to these regulatory trends, there are legislative issues. Enabling legislation is needed to either discourage the use of non-biodegradables and non-renewables, or encourage -- perhaps

through short-term incentives -- the development and commercialization of biodegradable and renewable resource technology. It is imperative that the new Farm Bill address the emergence of new markets for agricultural commodities and the potential benefits of these markets to the nation's economic, environmental and energy goals. It is equally important that the Farm Bill support the establishment of a composting infrastructure, not only as a means of enhancing market development efforts for renewable products but as a sustainable practice from which agriculture can benefit.

For any new technology, the presence of government restrictions and/or the lack of incentives for technological and market development can be crippling. In the case of biopolymers made from renewable resources, it may be necessary *in the short term* for government to help establish U.S. competitiveness in this area. But it will not be necessary *in the long term* for government to provide an artificial propping up of this technology.

Again, agriculture needs to speak with a unified voice to shape the regulatory and legislative debate on new uses, and to educate the new Congress about tomorrow's agriculture ... an agriculture that will not only produce food for the table but will also produce renewable resources which will lead to improved quality of life and energy independence.

The fifth and final challenge is convincing a disinterested and/or skeptical public that this technology is important. Many consumers are generally unaware of the environmental and energy crises that lie ahead as worldwide population continues to soar. On their hierarchy of daily concerns, waste management and the availability of petroleum don't register. Nor does the public give much thought to the "invisible" ingredients -- renewable or non-renewable -- in product packaging or foodservice ware. Until the public demonstrates a high level of understanding and concern for these issues, the benefits of biodegradable polymers made from renewable resources may fall on deaf ears and government will feel much less urgency to encourage further development of this technology and complementary markets and infrastructures.

Achieving awareness is only half the challenge. Undeniably, the public is much more aware of environmental issues than ever before, and they overwhelmingly support -- in concept -- environmentally friendly products and practices. But public attitudes do not always translate into public action. Studies show that while society supports "green" products, it is not yet willing to pay more than a 5 percent premium for such items. Nor is it willing to accept less performance than it has come to expect. Biodegradable products may be held to an even higher standard since claims for earlier products left the American public feeling misled and skeptical.

It's important for agriculture to understand that the development of biodegradable products from renewable resources be accompanied by efforts to educate and motivate the consuming public. Ultimately, consumers have the power to create or stifle demand for both food and non-food products from the farm.

MEETING THE CHALLENGES

Certainly, these hurdles are significant, but they can be overcome. This will require financial resources, perseverance and strategic partnerships.

It is no secret that agriculture does not have the voice it once did. Not since Abraham Lincoln was president has America had so few farms ... now less than 2 million. This means that to successfully develop and commercialize new technology, agriculture must work in closer partnership with government, others in industry and special interest groups which have the ability to advance non-food uses.

This may even mean working side by side with people agriculture has battled in the past. In the past, agriculture has on occasion been at odds with environmentalists, government regulators and the petrochemical industry. And yet today, all of these groups stand to benefit from the development and commercialization of products made from renewable resources. They must, therefore, find ways to work together, focusing on common ground rather than differences.

Collectively, the challenges to successful development and commercialization of biodegradable polymers made from renewable resources can be overcome in the next few years, resulting in a sizable market for corn and continued U.S. competitiveness in emerging "new use" technologies.

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